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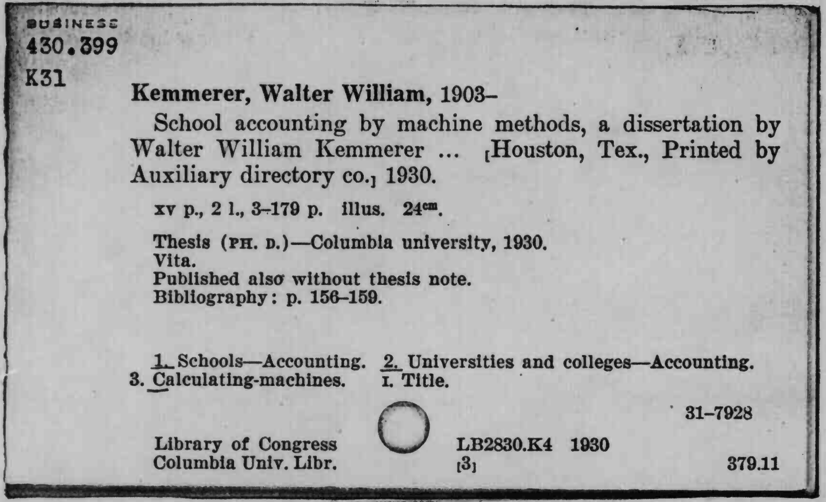

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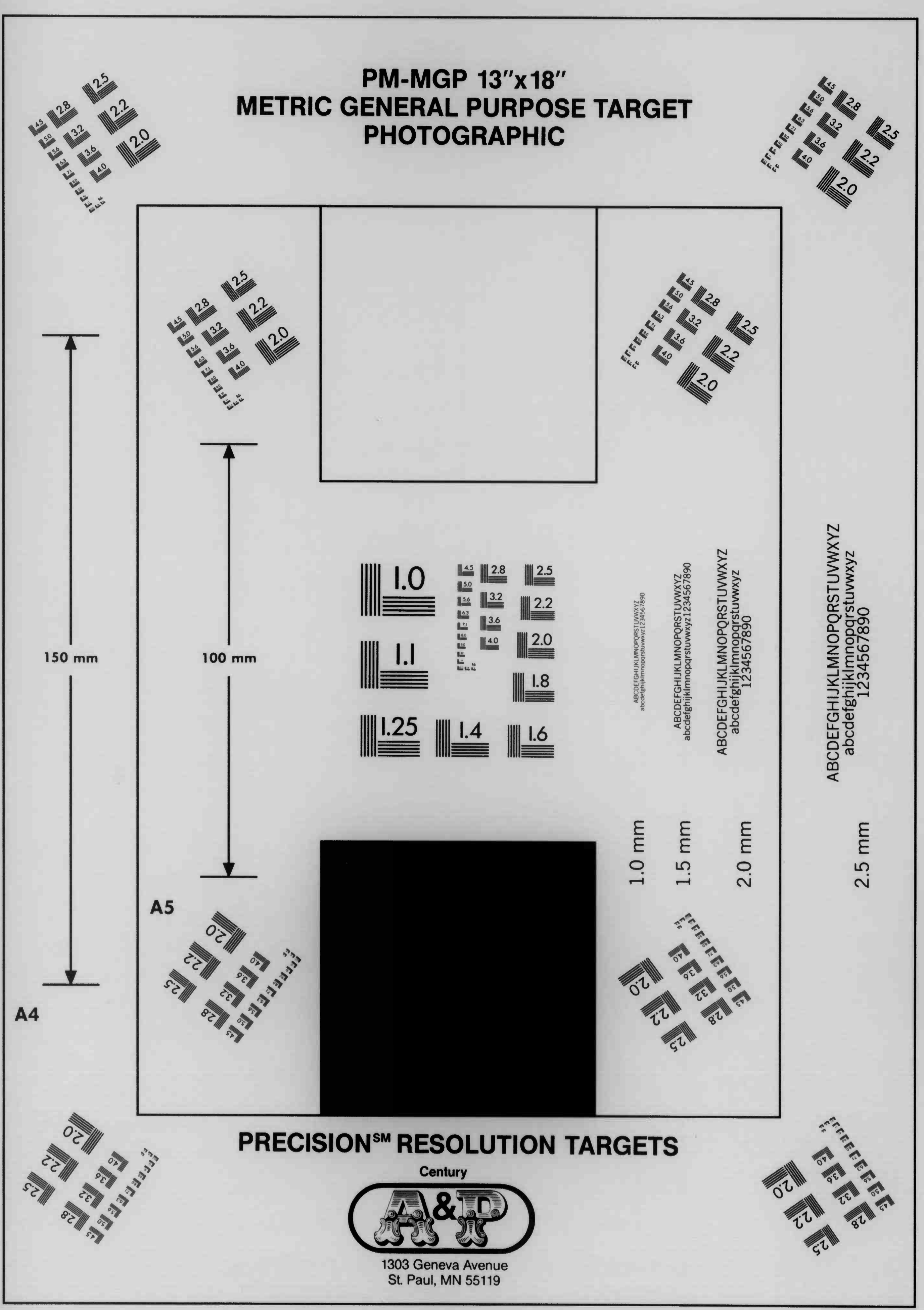

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SCHOOL ACCOUNTING

By Machine Methods

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INTRODUCTION

This study is intended to serve as a means of discovering and making available the advantages which may be derived from the use of mechanical equipment in school accounting and related procedures. It is hoped that it may be an aid to school superintendents, assistant superintendents in charge of business affairs, and companies making installations of their accounting equipment in schools.

The facts concerning the use of business machines in public schools have been secured from a personal study of seventeen public school systems, and from information secured by correspondence and other indirect means from seventeen other public school systems, all using mechanical accounting equipment. The term mechanical accounting equipment is used here to indicate the bookkeeping, billing, and tabulating machines. Although emphasis has been placed mainly on these machines, some attention has been given to the auxiliary equipment, such as protectographs, calculating machines, addressographs, etc.

The cities visited range in size from 20,000 to the largest city in the United States. The smallest city considered but not visited, has a population of 7,000. The cities which were visited are located in the East and Middle West, but those taken into consideration are scattered from coast to coast.

A score of cities were visited in addition to those mentioned above in which no application of mechanical equipment was made beyond that of adding and computing machines. No information has been used from this group of cities except as it has served to assist in the development and acceptance of principles given in Chapter II.

A personal study of eight universities was made and information secured concerning nine other colleges and universities, because the problem of accounting in universities has many elements in common with the problem in public schools, and because universities have made significant adaptations of machines to aid their business procedure. The universities considered were sixteen of the largest in the United States, located in the East and the Middle West.

Previous research studies in business administration and the general literature in the field of school administration were studied and drawn upon freely to assist the findings of this study in determining the principles governing the various phases of school business administration.

The results of the study are given in the following divisions:

PART I

A STUDY OF THE USE OF MECHANICAL EQUIPMENT IN ACCOUNTING FOR SCHOOL RECEIPTS AND EXPENDITURES

1. The Extent of the Use of Mechanical Equipment.
2. Principles of Business Administration Influencing Machine Adaptations.
3. Presentation and Evaluation of Ways of Doing the Routine Accounting Tasks by Machines.
4. Conclusions.

PART II

APPLICATION OF THE CONCLUSIONS OF THE STUDY IN THE DEVELOPMENT OF AN ACCOUNTING SYSTEM

5. A Complete Accounting System with Forms Drawn up to Secure the Greatest Possible Advantages of One Bookkeeping Machine.
6. Bookkeeping Principles Applied to School Accounting.

PART I

A STUDY OF THE USE OF MECHANICAL EQUIPMENT IN ACCOUNTING FOR SCHOOL RECEIPTS AND EXPENDITURES

CHAPTER I

THE EXTENT OF THE USE OF MECHANICAL EQUIPMENT IN SCHOOL ACCOUNTING AND RELATED BUSINESS ACTIVITIES

Purpose of the Study. The primary purpose of this study is to ascertain the advantages of the use of mechanical equipment in keeping school financial accounts. However, it is unwise to select this one phase of business administration and consider it alone. When financial accounts and records are kept by means of machines, it is often possible and more often necessary, in order to secure the maximum utilization of the machines, to combine many of the writing tasks. Since the information which is entered in the books of account is secured from the budget, requisitions, orders, vouchers, teachers' payroll, labor payroll, etc., the making and keeping of all of these latter supporting records should be considered when methods of keeping books of account are evaluated. The one may be a natural by-product of the other.

Need for the Study. All too frequently mechanical equipment is bought piecemeal. A check writer is bought now, then an addressograph, an adding machine, a bookkeeping machine, a tabulating machine. Each may serve an excellent purpose well, but their overlapping duties may not have been considered. Before such equipment is installed, a thorough study should be made of all the business office activities, and a count made of all entries necessary to show the information desired. From such a careful analysis and from a knowledge of the work machines can do, the need for machines can be more scientifically and economically determined.

Scope of the Study. Thirty-four public school systems in the United States were found which were using mechanical accounting equipment. This number was determined in part by a request which was sent to each of the six leading companies manufacturing and selling accounting machines, asking for a list of the names of all of the public school systems in which installations of their machines had been made. These lists were submitted in every case by the companies as partial lists of their installations. However, since the selection of cities was made from these lists and checked by personal investigation, which removed some cities from the lists and added others, it is reasonable to assume that this number very nearly represents the number of cities in the United States using bookkeeping or tabulating machines. Of course, there are many other public school systems using the simpler mechanical devices, such as typewriters, computing machines, numbering devices, addressographs, etc. However, the information in the study concerning this auxiliary equipment has been secured only from the group of cities studied.

TABLE I

THE NUMBER OF SCHOOLS AND UNIVERSITIES USING MECHANICAL ACCOUNTING EQUIPMENT IN FEBRUARY, 1929

Names of Machines	Number of Public School Systems Using the Respective Machines		Number of Universities Using the Respective Machines	
	Visited	Not Visited	Visited	Not Visited
Total No. of Cities	17	17	8	9
Hollerith	8	4	2	....
Burroughs Bookkeeping	4	2	3	2
Moon-Hopkins Bookkeeping	3	....	1	....
Underwood Bookkeeping	1	7	4	4
Remington Bookkeeping	2	1	4	4
Elliot-Fisher Bookkeeping	4	4	2	1
Addressograph	10	2	2*	2
Ditto	1	0	....	1
Check Protector	7†	....	2*	....
Calculating and Computing	11	....	8	....

Explanation: The numbers for the first six machines represent approximately the total number of installations in the United States, but the numbers for the last four machines are secured only from the fifty-one places found to have one or more of the first six machines listed above.

† Some of the dependent city school systems do not write their own checks.

* Many of the universities visited were state universities whose checks were written by the State Comptroller or Treasurer.

.... Each leader line indicates that the information was either incomplete or questionable.

Note: National Accounting Machines are being used in two of the state universities visited, in their hospital accounting.

TABLE II

THE PURPOSES FOR WHICH THE MACHINES CONSIDERED WERE USED IN THE CITIES AND UNIVERSITIES VISITED

Names of Machines	The Number of Installations Used For:								
	Accumulating Budget Totals	Order Writing	Check Writing	Stores Inventory	Making Extensions	Teachers' Payroll	Job Costs Labor Cost	Budget Control and Exp. Accts.	Writing Minutes
Hollerith	5	....	....	2	....	....	5	6	....
Burroughs Bkpg.	....	....	1	....	....	1	2	3	....
Moon-Hopkins Bkpg.	....	1	....	....	3	....	....	1	....
Underwood Bkpg.	....	....	....	....	....	....	....	5	....
Remington Bkpg.	....	....	3	....	....	....	....	2	....
Elliot-Fisher Bkpg.	....	1	2	....	....	....	....	2	3
Addressograph	....	....	10	....	....	8	....	....	....
Check Protector	....	....	9	....	....	....	....	....	....
Totals	5	2	25	2	3	9	7	18	3

Note: No attempt was made to determine the use made of calculating and computing machines. With the exception of the use for auditing invoices and computing extensions, the tasks they perform apply to almost everything. They are generally used and accepted as time-saving equipment.

The number of installations as shown in Table I without reference to Table II is in part deceptive, since many of the machines are used for only a small part of the accounting work. Even these tables viewed together cannot tell the whole story. They do not show whether the machine is used to do all the work of the given purpose. For example, only five of the eight universities using machines for bookkeeping (column headed budget control and expense accounts) kept practically all their accounts mechanically, and of the ten city school systems using machines for bookkeeping only five kept all or most of their accounts mechanically.

The following outlines are inserted to show the extent to which mechanical equipment is used in individual cities, and the type of work done. For this purpose four cities and three universities have been chosen. They have been selected intentionally to show variation in work done by means of mechanical equipment, to show variation in the amount of work done mechanically, and to show variation in the type of equipment used and the size of the system in which it is used.

Just enough of the business procedure is shown in the outlines to make possible an understanding of the work done by the machines. A change in the procedure greatly affects the possibility of the use of mechanical equipment. For example, if the city purchasing agent does the buying and writing of orders, if the city comptroller does the paying and writing of checks, and if the municipal offices keep the accounting records, it is evident that the business activities are broken up, and the possibility of multiple use of equipment and the avoidance of duplication of records is slight.

There is no uniformity in the form of these outlines as a result of their purpose. In some cases mechanical equipment was used in keeping the records of the distribution of supplies and stores records, and, therefore, enough of this procedure is shown to make a fairer presentation of the use of the equipment. In some cases where mechanical equipment was not used in stores procedure, it has been omitted from the outline. In all cases each outline has been built up around the machine application to show it in its natural environment.

Reference to the outlines provides a means of seeing at a glance present practice in the use of mechanical equipment in school business administration.

The work which is done with the aid of mechanical equipment is written in capital letters.

UNIVERSITY OF ILLINOIS

Expenditure Procedure.

1. Requisition is received in comptroller's office.
2. PURCHASE ORDERS ARE WRITTEN ON THE SAME OR FOLLOWING DAY ON AN UNDERWOOD FANFOLD TYPEWRITER.
3. PURCHASE ORDERS ARE ENTERED BY MEANS OF UNDERWOOD BOOKKEEPING MACHINE AS ENCUMBRANCES AGAINST BUDGET APPROPRIATION ACCOUNTS.

4. INVOICES ARE RECEIVED AND LISTED ON UNDERWOOD FANFOLD BY STATE BUDGET APPROPRIATION CLASSIFICATION OF ACCOUNTS, A SEPARATE LIST FOR EACH STATE APPROPRIATION. EACH LIST SHOWS SUB-TOTALS FOR EACH OF THE UNIVERSITY ACCOUNT GROUPS.
5. List is sent to State Auditor for payment.
6. Copy of list is returned to comptroller with check number entered.
7. THE PAYROLLS WITH NAMES AND AMOUNTS ADDRESSOGRAPHED ARE SENT TO STATE AUDITOR FOR WRITING CHECKS IN SAME MANNER AS ARE INVOICES AND THE INTERNAL PROCEDURE IS THE SAME AS FOR INVOICES.
8. Invoices are entered in cash disbursement journal by hand from the lists prepared under (4). (The cash disbursement journal is divided into fourteen columns according to a classification of expenditures into fourteen groups.)
9. INVOICES ARE ENTERED AS DISBURSEMENTS ON THE SAME ACCOUNTS ON WHICH THE RESPECTIVE PURCHASE ORDERS WERE ENTERED, CORRECTING THE UNENCUMBERED BALANCE IF THE AMOUNT OF THE INVOICE VARIES FROM THAT OF THE ORDER.
10. ALL STORES DISTRIBUTIONS ARE LISTED ON SUNSTRAND, A LIST FOR EACH STOREROOM, AND THE LIST TOTAL ONLY IS ENTERED AS A CREDIT TO STORES. EACH LIST SHOWS SUB-TOTALS FOR EACH UNIVERSITY ACCOUNT GROUP OR ORGANIZATION UNIT.
11. All distributions from stores are entered in an interdepartmental journal transfer with the same columnar analysis as the cash disbursement journal.
12. STORES DISTRIBUTED ARE ENTERED BY THE UNDERWOOD BOOKKEEPING MACHINE IN THE SAME MANNER AS INVOICES.
13. The amounts of the cash disbursement journal plus the amounts on the interdepartmental transfer journal for each group of ac-

counts serve as an internal check against the total of the disbursements recorded in the appropriation ledger by the Underwood.

UNIVERSITY OF WISCONSIN

Stores.

1. Revolving fund is set up to carry stock.
2. Stock is purchased by storekeeper through purchasing agent.
3 Quantity and value are entered on Kardex stock record cards with unit price.
4. Kardex file of blanket orders, approved by business manager, is used as a control of orders by departments.
5. UNIT CARD ACCOUNTS OR BILLS ARE SET UP FOR EACH INDIVIDUAL ORDERING SUPPLIES, SHOWING THE AMOUNT OF APPROVED ORDERS AND THE AMOUNT OF SUPPLIES DRAWN TO DATE. THE ENTRIES ARE MADE ON UNDERWOOD BOOKKEEPING MACHINE.
6. Stores deliveries distributed by requisition and amounts entered on stock record cards, on filed blanket orders, AND THE ACCOUNTS BY INDIVIDUAL.

Note: The requisitions are priced and extensions are made by hand. Annual physical inventory is taken, at which time the stock record cards are ruled and the corrected entry of stock on hand made.

Internal Service Department Orders. (Including Repair Work.)

1. Requisition for repair job is sent to accounting office and filed live till completed.
2. HOLLERITH CARDS ARE PUNCHED FOR EACH JOB ORDER REQUISITION SHOWING ESTIMATED AMOUNT AND ARE TABULATED BY BUDGET NUMBER AND POSTED TO BUDGET LEDGER BY BURROUGHS BOOKKEEPING MACHINE.
3. Job sheets are set up for each repair job with estimated cost of job entered as a control of the cost of the job.

4. NAME, TITLE, RATE, AND MAN NUMBER ARE PLACED ON DAILY TIME SLIPS BY ADDRESSOGRAPH.
5. Time slips are sent to accounting office daily where extensions are made by hand.
6. HOLLERITH CARDS ARE PUNCHED FOR TIME SLIPS AND FOR REPAIR MATERIAL USED FROM STORES OR DIRECT PURCHASE.
7. THESE CARDS ARE TABULATED BY JOB NUMBER. A MASTER CARD IS PUNCHED FOR EACH JOB ORDER FOR INDEX PURPOSES ONLY.
8. THE CARDS DESCRIBED IN NO. 6 ARE TABULATED BY JOB NUMBER AND POSTED TO JOB SHEETS DAILY BY BURROUGHS BOOKKEEPING MACHINE.
9. THE CARDS PUNCHED FOR TIME SLIPS ARE TABULATED SEMI-MONTHLY BY MAN NUMBER TO DETERMINE THE AMOUNT OF HIS PAY, THIS AMOUNT BEING CHECKED BY AN ADDING MACHINE TOTAL OF THE TIME SLIPS.

Payroll.

1. PAYROLLS ARE WRITTEN ON THE UNDERWOOD BOOKKEEPING MACHINE BY ACCOUNTING DEPARTMENT IN DEPARTMENT ORDER.
2. DISTRIBUTION OF PAYROLL CHARGES TO FUNDS AND DIVISIONS IS MADE BY HOLLERITH CARDS PUNCHED FROM THE VOUCHER.
3. Budget control of Salaries and Wages is kept by hand.

Note: The payroll cards are also tabulated with the Cash Disbursement Cards for the final cost analyses.

General Accounting.

1. Requisitions are written in triplicate and priced at source.
2. A TABULATING CARD IS PUNCHED FOR EACH REQUISITION.
3. CARDS ARE TABULATED BY BUDGET NUMBER.
4. BUDGET LEDGER ACCOUNTS ARE POSTED FROM TABULATIONS BY BURROUGHS BOOKKEEPING MA-

CHINE, THUS ENCUMBERING THE BUDGET APPROPRIATION.

5. CARDS ARE PUNCHED FOR ITEMS NOT COVERED BY REQUISITION, SUCH AS TRAVELING EXPENSES AND FOOD BILLS, AND ARE ENTERED ON BUDGET LEDGER BY SAME PROCEDURE AS SHOWN AFTER STEP 2, 3 and 4.
6. Purchase orders are issued by purchasing department. Invoices are received with affidavit from vendor.
7. CORRECTION TABULATING CARDS ARE PUNCHED FOR THE DIFFERENCE BETWEEN AMOUNT OF INVOICE AND REQUISITION.
8. CORRECTION CARDS ARE TABULATED BY BUDGET NUMBER AND PROPER DEBITS AND CREDITS POSTED BY BURROUGHS BOOKKEEPING MACHINE TO BUDGET LEDGER THUS CORRECTING THE ENCUMBRANCE AND FREE BALANCE.
9. TABULATING CARDS SHOWING DISTRIBUTION OF CHARGES OF CASH DISBURSEMENTS ARE PUNCHED FOR EACH VOUCHER. (A voucher may cover several invoices and vouchers are made for all cash disbursements including payrolls and food and travel items mentioned in No. 5 above.)
10. THESE CARDS ARE TABULATED BY FUND AND NUMBER AND LISTED ON THE UNDERWOOD BOOKKEEPING MACHINE.
11. LISTS OF VOUCHERS ARE WRITTEN ON UNDERWOOD BOOKKEEPING MACHINE AND ARE SENT TO STATE TREASURER, SIMILAR TO PAYROLL PROCEDURE.
12. CHECKS ARE WRITTEN AND NUMBERED BY STATE TREASURER AND SENT TO THE UNIVERSITY ACCOUNTING OFFICE WHERE CHECK NUMBER IS PLACED ON VOUCHER.
13. Vouchers are filed by number with a cross file of vendors card accounts filed by vendor.
14. THE CARDS UNDER COLUMN 9 MAY BE TABULATED BY BUDGET NUMBER. THE TOTALS OF THESE CARDS PLUS THE AMOUNTS OF THE REQUISITIONS ON FILE FOR WHICH INVOICES HAVE NOT YET BEEN RECEIVED SHOULD CHECK WITH THE BUDGET LEDGER.

15. THE CARDS INDICATED UNDER GENERAL ACCOUNTING COLUMN 9, REPRESENTING JOB COSTS, PAYROLLS, DIRECT PAYMENTS BY THE UNIVERSITY, AND VOUCHERS FORM THE CASH DISBURSEMENT CARDS FOR COST ANALYSES. THEY ARE AGAIN SORTED AND TABULATED BY:
    a. DIVISION AND FUND.*
    b. DIVISION AND ACCOUNT CLASSIFICATION.*
    c. FUND AND ACCOUNT CLASSIFICATION.*

Note: The purchasing department writes orders, audits the invoices, keeps the invoice register, purchase order copy file, file of bids and quotations, etc., all of which work is done by hand or with the aid of typewriters.

UNIVERSITY OF MINNESOTA

Accounting Records.

LOOSE LEAF LEDGERS POSTED ON UNIT CARD ACCOUNTS
GENERAL LEDGER
LAND AND BUILDINGS LEDGER
EQUIPMENT LEDGER
FUNDS LEDGER
BUDGET CONTROL LEDGERS, (POSTED FROM TABULATIONS BY DALTON LISTING MACHINE) INCLUDING:
  INCOME BUDGET CONTROL LEDGER
  EXPENDITURE BUDGET CONTROL LEDGER
  PAYROLL ITEM CONTROL LEDGER
  AUTHORIZATION CONTROL LEDGER

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* It is difficult to define these terms without reference to the classification of accounts followed by the University.

INCOME LEDGER (PRINTED DIRECT BY TABULATING MACHINE)
EXPENDITURE LEDGER (PRINTED DIRECT BY TABULATING MACHINE)

Other Machine Applications.

PAYROLL AND EXPENSE CHECKS BY BURROUGHS MOON-HOPKINS
COST RECORD ON CONSTRUCTION AND REPAIRS- REMINGTON BOOKKEEPING
WRITING PURCHASE ORDERS- UNDERWOOD FANFOLD
HOSPITAL RECEIPTS AND CHARGES POSTED AND CONTROLLED BY NATIONAL ACCOUNTING MACHINES.
INVOICE EXTENSIONS CHECKED BY USE OF MONROE AUTOMATIC

Instead of changing the color of the tabulating cards for different types of entries, two columns of the card are reserved for the code designating the type of entry. The following are the types of entries for which cards are punched:

0. Entries on Budget Control only
    00. Balance brought forward from last fiscal year
    01. Balance brought forward from last month's statement
    02. Allotments and Transfers of Funds
    03. Invoices Paid (Recap.)
    04. Payroll Abstracts (Recap.)
    05. Printing and Mimeographing Bills (Recap.)
    06. Requisitions
    07. Requisition Adjustments
    08. Authorizations (Job Orders)
    09. Authorization Adjustments
1. Journal Entries—on Budget Control and Income and Expenditure Ledgers
    10. Journal Vouchers—Miscellaneous Corrections and Adjustments
    11. Journal Vouchers—Interdepartmental Service Charges
    12. General Storehouse Bills
    13. Chemical Storehouse Bills
    14. Cold Storage Bills

3. Income Entries—on Budget Control and Income and Expenditure Ledgers
    30. Receipts reported by State Treasurer
    31. Student Fee Receipts
    32. Trust Fund Receipts
    33. Miscellaneous Receipts
    34. Inter-Collegiate Athletic Receipts
    35. Farm Receipts Distribution
4. Expenditure Entries—on Income and Expenditure Ledgers
    40. Expenditures—Expense Abstracts—State Treasurer
    41. Expenditures—Minnesota Loan and Trust Company
    42. Expenditures—Payroll Abstracts—State Treasurer
    43. Printing Department Invoices
    44. Mimeograph Department Invoices
    45. Authorization Billings
    46. Journal Vouchers—Corrections for types 40, 41, 43, 44, 46, and 47
    47. Expenditures—First Minneapolis Trust Company
5. Special Cards
    50. Authorization Ledger Trial Balance
    51. Authorization and Miscellaneous Payroll Analysis
    55. Expenditure Recapitulation

The following reports are made on the tabulating machine:

1. Budget Control Posting Lists (all cards 02 to 35)
2. Authorization Posting Lists (08 and 09)
3. Payroll Posting Lists
4. Miscellaneous Payroll Analysis—by Man
5. Miscellaneous Payroll Analysis—for Payroll Abstract
6. Budget Control Recapitulation
7. Budget Statements
8. Budget Control Trial Balance
9. Authorization Ledger Recapitulation
10. Authorization Ledger Trial Balance
11. Receipts by Fund
12. Expenditures by Fund
13. Adjusted Income by Fund

14. Adjusted Expenditures by Fund and Major Classification
15. Adjusted Expenditures by Fund and Classification
16. Income Distribution by Budget, Fund, and Department
17. Expenditures Distribution by Budget, Fund, Department and Major Classification
18. Capital Expenditures
19. Cumulative Income Distribution
20. Cumulative Expenditure Recapitulation
21. Liability Check List-Requisitions (Open and Closed)

Note: This system represents the most completely mechanized accounting system of all the systems visited. It represents also the fullest and probably most efficient use of the tabulating machine in school accounting. This brief outline of the work done in the accounting office with the aid of mechanical devices can only show the extent of the machine work and not the detailed procedure. Most of the above information is quoted directly from the Bulletin of the University of Minnesota.†

NEW YORK CITY

Supplies.

1. Requisitions, priced when written, are sent in by schools monthly.
2. Requisitions are entered by hand to control book by school and activity.
3. Requisitions are tabulated by hand by article, shcool and number.
4. Tabulations are checked against stores ledgers.
5. PURCHASE ORDERS ARE WRITTEN FOR NECESSARY PURCHASES BY MEANS OF BURROUGHS MOON-HOPKINS.
6. Material is delivered to stores and direct to schools.
7. Material is distributed from stores during month following requisition date.

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† Bulletin of University of Minnesota, Report of the Comptroller tor the Year Ending June 30, 1927. Vol. XXX. Pl28ff. No. 85 December 1927. Published by the University of Minnesota, Minneapolis, Minnesota.

8. The record of the amount of supplies distributed from stores or delivered direct from vendor is sent to finance department and annually analyzed by school and account.

Finance Department.

1. Entries are made from original documents, orders, payrolls, etc., to: (a) Maintenance Ledger, (b) Payroll Ledger, (c) Contract Ledger.
2. Totals are posted monthly to major control accounts set up by activity.
3. ALL ORIGINAL DOCUMENTS GO TO STATISTICAL DEPARTMENT FOR ANALYSIS OF MAINTENANCE AND OPERATION AND CAPITAL OUTLAY COSTS BY BOROUGH AND BUILDING, BY MEANS OF TABULATING MACHINES.

CLEVELAND*

1. Purchase requisition is written in duplicate.
2. Purchasing agent gets bids and places orders.
3. Purchase order is written (7 copies).
4. Estimate of purchase order is entered on vendors' accounts.
5. HOLLERITH CARDS ARE PUNCHED FROM INFORMATION ON PURCHASE ORDER.
6. Material is delivered to school or store.
7. Invoice is received and audited.
8. HOLLERITH CARD PREVIOUSLY PUNCHED FOR ESTIMATE ON ORDER, IS NOW PUNCHED AGAIN FOR ACTUAL AMOUNT OF INVOICE.
9. CHECKS IN PAYMENT OF MATERIALS ARE WRITTEN ON REMINGTON BOOKKEEPING MACHINE ACCUMULATING TOTALS.
10. A resolutions ledger is set up to control all contracts and obligations incurred by School Board resolution.
11. A DIFFERENT CARD IS PUNCHED FOR PURCHASE

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* Since the writing of this material Cleveland has changed its accounting system and equipment.

ORDERS FOR RESOLUTIONS GIVING RESOLUTION NUMBER. SUCH CARDS TABULATED BY RESOLUTION NUMBER FOR POSTING TO RESOLUTION LEDGER, THEN TABULATED WITH REGULAR PURCHASE ORDER CARDS

12. Supplies are distributed from stores on stores requisition. All stores routine work is done by hand using McCaskey Register to keep stores records.
13. HOLLERITH CARDS ARE PUNCHED FOR MATERIAL DISTRIBUTED FROM STORES.
14. Repair requisitions are written for all repair work.
15. A job cost record is set up for each job giving estimate of cost.
16. A HOLLERITH CARD IS PUNCHED FOR ESTIMATE OF JOB COST.
17. Repair material is distributed from stores or directly from vendor.
18. HOLLERITH CARDS ARE PUNCHED FOR MATERIAL REPAIR JOBS FOR WHICH JOB COST RECORDS HAVE BEEN SET UP.
19. HOLLERITH CARDS ARE PUNCHED FOR LABOR ON REPAIR JOBS FROM DAILY TIME SLIPS.
20. LABOR AND MATERIAL CARDS ARE SORTED AND TABULATED BY JOB, posted to job cost record AND ONE CARD PUNCHED FOR EACH JOB (same card in step 14).
21. ONE CARD IS PUNCHED PER TEACHER AND OTHER EMPLOYEES FOR SALARIES FROM PAYROLLS (see payroll).
22. TABULATIONS ARE MADE OF ALL CARDS FOR POSTING TO THE APPROPRIATION LEDGER BUDGET ACCOUNTS (not by school). After estimated amounts are entered only the over and under amounts are entered after the actual amount is known.
23. MONTHLY TABULATIONS ARE MADE BY SCHOOL AND ACCOUNT AS A REPORT TO THE SCHOOL OF THE EXPENDITURES AND BALANCE OF EACH ACCOUNT. THREE CARDS MUST BE PUNCHED FOR EACH ACCOUNT OF EACH SCHOOL TO ENTER: (a) Amount of appropriation. (b) Amount of expenditure to date. (c) Expenditure of current month.

Payroll

HEADQUARTERS PAYROLL

1. Daily time sheet is kept for clerks.
2. A clerk in each department types a copy of the time sheet and also the officers' payroll.
3. The payroll is sent to payroll department for auditing and writing checks.
4. The payroll is then sent to the tabulating department.

CUSTODIAN'S REGULAR AND OVERTIME PAYROLL

1. The daily record of time is sent to payroll department monthly.
2. The payroll is made up and checks are written.
3. The payroll is sent to the tabulating department.

MECHANIC'S PAYROLL

1. The daily time report including carfare is sent to the payroll department.
2. The accounts are extended and posted to individual records.
3. The payroll is made out and checks are written.
4. Original daily time slips are sent to the tabulating department.

TEACHERS' PAYROLL

1 Payroll is made out by principal's clerk in September—payroll printed and proof sheet sent to principals in October for correction and to serve as payroll—final form is printed and sent out in November and succeeding months.
2. Substitutes' names and amounts are added to the printed payroll for tabulating department and to serve as a check against the substitutes' daily time report.
3. The payroll is sent to payroll department for auditing AND WRITING OF CHECKS BY ADDRESSOGRAPH for regular teachers only.
4. Payroll is then sent to the tabulating department.

SUBSTITUTES' PAYROLL

1. The daily time slips are sent to the payroll department.
2. Time slips are sorted by teacher and type of school.
3. A check is written for each teacher for each type of school taught.

4. The time slips are sorted by school and checked against the principal's monthly payroll.
ONE MASTER CHECK IS WRITTEN TO THE TREASURER COVERING THE ENTIRE PAYROLL.

MINNEAPOLIS

Budget Control

Accounting Office

1. Control of Disbursements is kept by accounts as set up in the budget and not subdivided by building. This department is not concerned whether the supplies go to stores or schools or whether they are equitably distributed but only that the amount of disbursement is within the budget appropriation.
2. Purchase requisitions are received.
3. THE PURCHASE REQUISITION ESTIMATED AMOUNTS ARE POSTED IN THE APPROPRIATION ENCUMBRANCE REQUISITION LEDGER BY MEANS OF BURROUGHS BOOKKEEPING MACHINE.
4. The purchase requisitions are sent to the city purchasing agent.
5. Purchase orders are returned by city purchasing agent.
6. TABULATING CARDS ARE PUNCHED FOR ALL PURCHASE ORDERS.
7. Invoices are received.
8. TABULATING CARDS ARE PUNCHED FOR ALL INVOICES AND NUMBERED THE SAME AS THE RESPECTIVE PURCHASE ORDERS IN ORDER TO BE ABLE TO SORT THEM TOGETHER.
9. TABULATIONS ARE MADE MONTHLY AND SEMIMONTHLY TO MAKE MONTHLY APPROPRIATION BALANCE REPORT. CARDS ARE USUALLY SORTED DAILY.

Business manager's Office

10. Cost ledger and control of distribution is set up by schools and departments.
11. Unit cards are set up for each account. The budget allowance and the estimated amount of each requisition as soon as it is approved are entered thereon. The encumbrances is corrected from the invoice or priced stores requisition. This work is done by hand. Accounts are set up for building, department, or grade, and object.

Stores.

1. Purchase requisition is written to obtain stock.
2. The quantity is entered on card inventory record by hand and new unit price averaged.
3. Stores requisition is written to distribute stock.
4. Quantity distributed is entered on stores inventory cards and unit price entered on requisition by hand.
5. REQUISITIONS ARE EXTENDED BY MEANS OF BURROUGHS MOON-HOPKINS.
6. ANNUAL INVENTORY OF VALUE OF STOCK RECORDED ON STOCK RECORD CARD IS MADE BY MULTIPLYING UNIT PRICE BY AMOUNT OF STOCK ON HAND FOR EACH ITEM OF STOCK, BY MEANS OF BURROUGHS MOON-HOPKINS.

JOHNSTOWN

Bookkeeping.

1. Requisitions are received.
2. Purchase orders are issued.
3. Invoices are received.
4. The voucher jacket is prepared and the distribution made thereon for posting to three records,
   a. For posting to charge register by major classification of accounts. This is a columnar record posted by hand, debits to expense accounts and credits to funds. The monthly totals of major accounts are posted to general ledger. This does not serve as a budget control.
   b. For posting to appropriation ledger by account. This is the only ledger serving as a budget control. THIS IS MAINTAINED by ELLIOTT-FISHER CARD ACCOUNTS POSTED FROM HAND ACCUMULATED TOTALS OF VOUCHERS TO LESSEN NUMBER OF NECESSARY

ENTRIES.

c. For posting to cost ledger, a subdivision of the appropriation accounts by school. There is no budget control on these records. THIS IS MAINTAINED BY ELLIOTT-FISHER CARD ACCOUNTS POSTED DIRECTLY FROM VOUCHERS.

5. WHEN ALL ACCOUNTS ARE CLOSED ANNUALLY BY MAKING A CREDIT ENTRY EQUAL TO THE CHARGES TO THAT ACCOUNT, THREE CARBON COPIES ARE MADE THESE THREE COPIES HAVE THREE VERTICAL COLUMNS, EACH OF WHICH IS SO PLACED THAT THE THIRD COLUMN OF THE TOP SHEET IS PLACED OVER THE SECOND COLUMN OF THE SECOND SHEET AND OVER THE FIRST COLUMN OF THE THIRD SHEET. THE LAST SHEET GIVES A COMPARISON FOR THREE YEARS MADE IN ONE OPERATION, BY WHICH OPERATION THE ACCOUNTS ARE ALSO CLOSED. THE FIRST AND SECOND COPIES OF THIS YEAR ARE USED AS THE SECOND AND THIRD COPIES OF NEXT YEAR. IN THIS WAY ONE SHEET ALWAYS HAS A THREE YEAR COMPARISON OF COSTS WITHOUT THE EXTRA LABOR OF ALWAYS COPYING THE FIGURES FOR THREE YEARS ON ONE SHEET ANNUALLY. THESE FORMS ARE SHOWN IN EXHIBIT 15. THIS CLOSING WORK IS DONE BY ELLIOTT-FISHER MACHINE.

Tax Roll and Tax Duplicates. THE SCHOOL BOARD WRITES ITS OWN TAX DUPLICATES AND MAKES THE TAX ROLL AT ONE OPERATION ON THE BURROUGHS MOON-HOPKINS, WHICH COMPUTES AND ENTERS THE AMOUNT OF TAX DUE.

Payroll. (THE MAKING OF THE PAYROLL REQUIRES TWO OPERATIONS, ONE ON THE ADDRESSOGRAPH AND ONE ON THE ELLIOTT-FISHER. THE PAYROLL FORM AND THE SHORT FORM FOR THE STATE RETIREMENT REPORT STAY IN THE MACHINE UNTIL FILLED OR COMPLETE. THE CHECKS ARE PLACED IN THE MACHINE ONE AT A TIME IN THE PROPER ALIGNMENT).

THE ADDRESSOGRAPH:

1. STAMPS THE NAME ON THE SHORT SHEET FOR RETIREMENT FUND REPORT TO THE STATE.
2. MAKES A CARBON COPY OF THE NAME ON THE PAYROLL.
3. STAMPS THE NAME ON THE CHECK.
4. STAMPS AT THE SAME TIME THE ACCOUNT NUMBER AND TITLE OF THE ACCOUNT AND THE BEGINNING AND ENDING OF THE PAYROLL PERIOD OF THE CHECK ONLY. (THE ACCOUNT NUMBER AND TITLE ARE ON THE NAME PLATE BUT THE DATES OF BEGINNING AND ENDING ARE ON A SEPARATE PLATE SERVING FOR ALL PAYROLL CHECKS).

THE ELLIOTT-FISHER:

5. WRITES THE RATE, MONTHLY SALARY, AND THE RETIREMENT DEDUCTION ON THE FORM OF REMITTANCE ADVICE ATTACHED TO THE CHECK, MAKES CARBON COPIES OF THIS INFORMATION ON THE RETIREMENT FUND REPORT TO THE STATE, AND ON THE PAYROLL.
6. WRITES THE ABSENCE DEDUCTION ON THE REMITTANCE ADVICE ATTACHED TO THE CHECK AND MAKES A CARBON COPY ON THE PAYROLL.
7. WRITES THE NET AMOUNT IN LETTERS ON THE CHECK PROPER WITH A CARBON COPY ON THE PAYROLL.
8. WRITES THE NET AMOUNT IN FIGURES ON THE CHECK AND MAKES A CARBON COPY ON THE PAYROLL.
9. COPIES THE CHECK NUMBER ON THE PAYROLL.
10. ACCUMULATES THE TOTAL OF THE RETIREMENT FUND DEDUCTIONS FOR THE STATE REPORT.
11. SUBTRACTS THE RETIREMENT AND ABSENCE DEDUCTION FROM THE MONTHLY SALARY TO SECURE THE NET AMOUNT OF THE CHECK.

12. ACCUMULATES THE TOTAL OF MONTHLY SALARIES, RETIREMENT AND ABSENCE DEDUCTIONS, AND NET SALARIES. THE FIRST MUST EQUAL THE SUM OF THE LAST THREE.

Checks in Payment ot Materials. (THE FOLLOWING WORK IS DONE ON THE ELLIOTT-FISHER BOOKKEEPING MACHINE).

1. THE CHECK REGISTER SHOWING THE NAME OF THE VENDOR, THE AMOUNT OF THE CHECK, FUND DISTRIBUTION, VOUCHER NUMBER, CHECK NUMBER, AND DATE, IS PLACED IN THE MACHINE.
2. OVER THE CHECK REGISTER ARE PLACED THE REPORT FOR THE FINANCE COMMITTEE, A BLANK TO OBTAIN A CARBON OF THIS REPORT, AND THE CHECK ITSELF.
3. ON THE CHECK IS WRITTEN THE NAME OF THE PAYEE AND THE AMOUNT OF THE CHECK WHICH CARBONS TO THE CHECK REGISTER AND THE FINANCE COMMITTEE REPORTS.
4. ON THE CHECK ALSO ARE WRITTEN THE DATES AND AMOUNTS OF EACH INVOICE WHICH CARBONS ONLY TO THE FINANCE COMMITTEE REPORT. FOR THIS REASON THE FINANCE COMMITTE REPORT FORM IS ARRANGED TO BE MOVED AHEAD FIVE SPACES FOR EVERY ENTRY WHILE THE CHECK REGISTER MOVES ONLY ONE.

SUMMARY

1. Thirty-four public school systems in the United States are using mechanical accounting equipment.
2. Mechanical accounting equipment is used chiefly in posting the expenditure ledgers.
3. Of the auxiliary equipment the addressograph is used most frequently for payroll work.
4. No two installations of the same machine in different systems use similar forms or procedure.
5. Taking the thirty-four city school systems and the seventeen universities using mechanical accounting equipment into consideration, an example can be found showing the use of a machine for each task of general accounting involving writing or calculating, but not one system was found in which all such tasks were done mechanically.

CHAPTER II

PRINCIPLES OF BUSINESS ADMINISTRATION INFLUENCING MACHINE ADAPTATIONS

Before an evaluation of the different ways of doing the work of the business office is attempted, before conclusions are drawn, and before suggested best ways of doing the work are set up, it is quite essential that some attention be given to what work ought to be done. While it is not the purpose of this study to determine the principles of good school business administration and the work necessary to put these principles into practice, such principles are assembled here, taken verbatim in those cases where principles have been listed, or gleaned in other cases from research studies and texts of school and general business administration. To determine what is the most efficient way of keeping individual accounts with vendors or individual accounts with all employees is one problem; it is another problem to determine whether such individual accounts should be kept at all.

In Chapter III problems of determining efficient procedures are treated individually without regard to their interrelations. In Chapter IV, from the results of Chapter III, the conclusions affecting the use of bookkeeping machines for doing all the work connected with business activities of city school systems are drawn up. The recommended procedure embodied in the conclusions is based on the principles set up in this chapter. If local conditions or state legislation cause variation from these principles and perhaps consequently in the detail of the work in the business department, necessary adjustments in the mechanical procedure can be made locally. In such cases the recommendations of Chapter IV will still be valid and can be applied with the necessary adjustments for additional or decreased work.

THE PROBLEM OF THE MAINTENANCE OF SCHOOL PROPERTY

School property must be kept in a good state of repair for the safety and health of those using it as well as for the proper safeguarding of public wealth. From this statement develops a program which necessitates the making of decisions by the administrative staff, which must be supported by facts.

Repair Work—By Contract Versus by School Maintenance Staff. The repair work may be done by contract or by a permanent force of repairmen or by a combination of these two methods. Regardless of the method used in having repairs made, records of costs must be kept. The amount of labor involved in keeping records when the school maintains its own force of skilled labor is necessarily much greater than when all the work is done by contract. Records must be kept, however, in order to determine the most economical way of doing the work, taking into consideration the quality and promptness of the execution.

The experience of cities points toward the administration of all repair work directly by school authorities. Engelhardt and Engelhardt* make the statement: "The judgment of the majority of school officials associated with the work of public schools seems to warrant the conclusion that in so far as possible all operation and maintenance should be carried on by those directly responsible to school authorities. Contract work should be reduced to a minimum consistent with economy and efficient administration."

One large university compels certain of its service departments to submit a bid in competition with outside agencies. This is a check on the economy of the work.

It is not fair to base the decision on money alone, especially in public schools where service is the most important factor. If a repair department is maintained, occasional competitive bids serve as a good check on the efficiency of the department.

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*Engelhardt, N. L. and Engelhardt, F. Public School Business Administation, Page 366. Bureau of Publications, Teachers College, Columbia University, 1927.

Cost Accounting and Repair Work. As this study is concerned mainly with accounting, the records and reports needed to conduct the maintenance program are of major importance. Schwartz* would subdivide repair costs in such detail that the cost of the objects repaired, such as doors, door checks, bells, etc., can be determined. This can be done, but records are needed if the administrator wants to do a thorough job.†

In order to ascertain accurately whether articles can be made more cheaply in the shop than they can be bought in the open market, the cost of overhead, including the maintenance and operation and capital cost of the shop building, must necessarily be charged against the cost of producing the article in the shop. In the same manner the cost of the overhead of the maintenance department must be charged against the cost of the individual job. If any comparison is to be made with the cost of the same repair work done by contract, failure to allocate the overhead in either of these cases would introduce an error.

It is not customary practice to allocate the overhead to the job or article. Practice follows the simpler bookkeeping method of charging only material and direct labor against the job and placing the overhead as a separate item in the budget. The simplicity of recording and additional cost necessary to allocate continually this overhead seem to be sufficient justification of the present procedure in public school accounting. The proportionate cost of the overhead can be ascertained annually and allocated annually to the cost accounts, thus producing accurate records for comparative purposes. This proportionate figure computed to add the overhead to the direct cost can also be used during the year when accurate comparisons of cost between repair by contract and by the school's employees is desired. For purposes of budgetary control there is no

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* Schwartz, N. M. The Improvement in the Maintenance of Public School Buildings. Bureau of Publications, Teachers College, Columbia University, 1926.

† While the investigations for this study were being made one city was found which kept even more detailed records, recording the cost of repair against the individual article repaired.

need for the continuous allocation of overhead to the job or article produced. In fact, it simplifies budget control not to allocate it.

The possibility of allocating the overhead only at the end of the year, as a matter of cost record and for cost comparisons, differs from procedure of commercial institutions. However, in commercial institutions the article is to be sold and paid for immediately, while in the school system the article is not sold and there is no direct transfer of money. From this standpoint it is just as well to control the direct cost separately from the indirect or overhead, combining the two only when there is need, as in making accurate comparisons.

These principles apply to all school systems regardless of size. It is quite evident also that the small city which does not retain a maintenance staff will have a much simpler bookkeeping problem. However, even in the small cities where the repair work may be done in large part by the janitors, the cost of materials and labor for repairs should be accounted for separately. The simplification due to size of the city ought not to be in the type of records kept but only in the volume of records. A city having only one or a few buildings, if it wants to conduct an efficient maintenance program, will want to know the cost of keeping in good state of repair its boilers, typewriters, glazing, painting, furniture, etc. The larger city will maintain similar records with the more ample field for cost studies made possible by the large number of units.

Principles Governing the Accounting for Maintenance Costs. With this preliminary discussion the principles governing the office work connected with the maintenance program will be set up*. No attempt will be made to defend them individually, but the references on which they are based are included at the end of the book.

1. A definite program of maintenance must be set up.

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* A very complete checking list for evaluating the maintenance of the school plant can be found in the appendix of Engelhardt and Engelhardt, " Public School Business Administration," particularly Part IV, " Records Available for Answering Questions in Regard to Maintenance ." Page 947ff, gives the detailed information which should be accumulated and maintained in a good maintenance department office.

2. A budget must be prepared presenting the estimated cost of this program.
3. The budget should be prepared in the central office.
4. The budget must be a part of a program taking into consideration plant conditions many years hence.
5. A property inventory shall be maintained.
6. Permanent continuing records must be kept of the amount and value of repair supplies on hand, received, and disbursed to the various jobs.
7. A thoroughgoing cost accounting system must be set up for the determination of maintenance costs to include:
   (a) Budget estimate of amount to be expended for maintenance annually, estimates being given by site or plant, by individual job for larger repairs, and type of repair for smaller jobs.
   (b) A requisition for each repair job.
   (c) Issuance of order (job, open, or contract) for the work to be done.
   (d) Requisitions of repair material from stores if the work is done by the school's mechanics.
   (e) Daily time reports of the time spent by each employee on a job.
   (f) Job cost record of the amount and cost of material and labor for each job.
   (g) Budget appropriation control accounts set up in the same classification as the budget appropriations approved by the Board of Education.
   (h) Records of the cost of the overhead of the maintenance department.
   (i) If the material to be used in the repair work is to be made by a shop department, a shop job card must be set up for each article or order of identical articles, and the amount and cost of raw material used and labor expended recorded thereon. The total cost of the production of this article is then recorded on the job cost card as material cost.

THE PROBLEM OF PURCHASING

The Controversial Issue of Annual Purchasing. The question of whether purchases should be made annually, monthly, or at other intervals is still unanswered. The purpose of this study, as has been said in the introduction, is not to answer such question, but merely to find the best method of taking care of the bookkeeping work and to some extent the office work for any method of purchasing. The general conclusion usually given in texts is that purchases should be made annually by small systems to take advantage of quantity purchasing, and monthly when the volume of purchases warrants it, taking advantage of better and fluctuating prices.

Mr. Womrath, Business Manager of the Minneapolis Schools, in an unpublished article states that purchases should be made several times a year to prevent producing a peak of unusual business in the supply houses interfering with the economical filling of orders as well as transportation of the goods.

The purchasing agent in a well ordered purchasing department in a large university in the Middle West is of the opinion that to change from annual to more frequent purchasing for the bulk of their supplies would engulf the department in a mass of detail work entirely unjustifiable. This opinion was seconded by the stores and accounting departments in this university. The same opinion holds true in some very large cities, but at the same time the exact opposite holds in other large cities where purchases are made monthly or when needed.

New York City makes an annual budget allotment of supplies by school and department and uses this as a control of distribution. Its purchases are made monthly, based on the need as shown by tabulating the requisitions. Purchases are then made from these tabulations, taking the stores inventory into consideration. Requisitions are submitted monthly, but deliveries are not guaranteed until the following month after necessary purchases have been made. Contracts for books are placed for a four or five year period and for supplies for a one year period. Orders can then be written and priced from the standing contract price. However, for special orders, reference books, special supplies, etc., not found on these contract lists, a request for quotations is first sent out to the seller of this article as indicated by the teacher or principal on the requisition. In many cases the dealer refuses to submit a bid, probably because of the smallness of the order, because of the time elapsing before payment of the order, or for other reasons. The peculiar result is that a book which any individual can purchase at one of the large department stores frequently cannot be purchased by the Board of Education.

The foregoing examples are given only to show that in the field of practice the several methods of making purchases have each their strong and staunch supporters. Conclusive evidence concerning the relative merits are not yet available.

Control of Purchases. Keeping the control of purchases by quantity and value of each article needed may require some explanation. Frequently the purchases are controlled by the functional classification of accounts. For example, it is estimated in the budget that $8,000 will be needed for high school art supplies. This amount acts as a control of the amount of purchases of art supplies for the year. It does not, however, control the amount of the necessary purchase of each individual article, which is left to the discretion of the purchasing department. Since allotments are defined, and since card accounts ought to be set up for each article for reference to vendor and price, for the sake of economy there is no reason why the card account should not be expanded and serve as a control of purchases by article.

The detailed ledger accounts, set up in terms of the budget appropriation for the respective accounts, serve as the control by function of disbursements and stores distributed. There is no further need of controlling purchases by function. The appropriation accounts are also cost accounts, since they take into consideration all expense. The estimated amounts on the supply appropriation accounts in the appropriation ledger are derived from the standard allotment per pupil for that type of supply expressed in dollars and cents. This money estimate is based on a definite quantity of the item of supply to be allotted per pupil. The purchasing department should be governed in its purchasing by a tabulation of these quantity allotments and the stores records.

Accounting for Supplies Used in More than One Department. There enters an unnecessary complication of recording when the purchases are controlled by the estimated amounts to be spent for the functional accounts. This is caused by the fact that the article is bought and charged in that functional account which uses most of it. For example, alcohol is generally bought as an industrial arts supply. All purchases of alcohol are therefore recorded by the purchasing department against industrial arts supplies. When alcohol is requisitioned for the art department, the industrial arts account must be credited for that amount so that its apportionment will not be encumbered by a supply used by another department. This amount must be debited to the art supplies account to control it. All this additional bookkeeping is avoided by using the article cards as a control of purchases.

Effect of Control of Purchasing by Quantity and Value. Some systems allocate a lump sum for the purchase of a certain type of supplies. For example, when ten thousand dollars is appropriated for music supplies, the purchasing department is authorized by the budget to purchase music supplies to this amount. This in no way assists them in purchasing the correct amount of the needed material, nor does it prevent them from purchasing too much of one article and not enough of another. When the amount to be purchased is controlled by the number of music books, quantity of sheet music, etc., the total cost of which is estimated at ten thousand dollars, the purchasing agent knows definitely how much of each article he is expected to buy. If the price of supplies should rise during the year or before purchases are made, with the purchasing department controlled in its buying by quantity alone instead of budget allotment of money, the budget appropriation for supplies may be exceeded.

However, if 200 music books are to be bought at a budget estimate of fifty cents each, and the price of music books rises to sixty cents before they are purchased, the money allotted will only buy 166 music books. Shall 34 pupils study without books? The first answer is, "They shall not." If educational value comes first, therefore, the control of purchase by quantity will prevail. If the prices advance, education will not suffer but the budget will need further appropriation. The second answer, from an accounting standpoint, if funds are absolutely limited and educational values are to be considered secondary, is to control the purchases by the estimated money value on the article cards, and continuing the foregoing example buy one hundred dollars worth of music books, instead of 100 music books. If prices should fluctuate, it would always be possible to curtail the use of the less indispensable supplies and transfer the saving to the indispensable supplies to enable the distribution of the needed quantity. The article card accounts, therefore, serve as a control of quantity of the purchases as well as the budget appropriation for these purchases. The supply accounts in the ledger set up by grade, department, and building are controlled by money allotment or appropriation. If there is need for curtailment because of increase in prices the appropriation must be adjusted accordingly.

Principles of Supply Purchasing. Probably the most extensive and intensive research study in the field of school supplies is Taylor's* study, "Principles of School Supply Management." In this study can be found a very complete set of principles applicable to purchasing. To these may well be added that purchasing should be done by a school purchasing agent in preference to a city purchasing agent to avoid possible duplication of records and work, and possible delays in furnishing material. If the local situation demands that purchasing be done by a city purchasing agent, he should be given the information relative to what need be purchased with complete specifications, and have no discretionary powers to decide whether or not the material is to be purchased.

Principles Governing the Records of the Purchasing Department. The purchasing department should be governed by the following principles, which affect especially office management regardless of the particular method of buying:

1. An account should be set up with each vendor showing amount of orders placed, necessary corrections from the invoices, the amount paid, and the balance due.

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* Taylor, R. B. Principles of School Supply Management. Bureau of Publications, Teachers College, Columbia University, 1916.

2. From the standard lists of supplies, the lists of allotments, and the number of pupils in each grade or department the quantity of each item of supply can be determined. An account should be set up for each article showing the quantity needed for a year's supply and the estimated cost of that quantity.
3. The quantities and cost of articles purchased regardless of the frequency of purchasing periods can be entered on these accounts. Such accounts function actively as a control of purchases, since they tell the purchasing department how much to buy, how much they have bought to date, and how much remains to be bought to complete the year's need.
4. A certain percent or amount of money is set apart in the budget for each grade, building, or department for supplies which cannot be anticipated and therefore cannot be placed on the standard list. The accounting department should have an account for each grade, building or department having such an allotment, showing the amount of the allotment, the amount purchased to date, and the unexpended balance. Since all requisitions must be approved by the accounting department for available balances in the respective accounts, the requisitions for standard supplies are checked and forwarded to stores, while the requisitions for unanticipated supplies or equipment are checked and forwarded to the purchasing department for buying.
5. The article cards set up under Principle Number 2 should also show the vendors supplying that item.
6. There may be also a catalog index showing the articles, alphabetically arranged, which can be bought from each vendor. This serves as a cross file of the article card accounts.

THE PROBLEM OF STORES—STORAGE, DISTRIBUTION AND ACCOUNTING FOR SUPPLIES

Some of the questions arising in the consideration of the problem of stores are:

1. Shall all supplies be delivered to a central storehouse?

2. Shall all or most of the year's supplies be delivered direct from the vendor to the school building?
3. If certain supplies are to be distributed through the central store and certain supplies direct, what will determine the distinction?
4. If a central store is set up, how will the overhead cost be classified or entered on the cost records?
5. Shall a revolving fund be set up for stores?
6. Do the same principles apply to all school systems regardless of size?

Examples of Opinion and Practice in Stores Procedure.

Example 1. New York City handles all its supplies through central storehouses with the exception of the chemicals and other supplies and equipment which are fragile. The reason for this is very good. If these supplies are sent to central storehouses, unpacked and stored, they must be repacked carefully to avoid breakage during distribution. Therefore, these supplies are ordered by building and delivered directly to the buildings in the original packing of the vendor.

Example 2. Taylor* gives as one of his conclusions that the practice of distributing supplies from a central storeroom to the respective buildings monthly or as needed involves an excessive waste of time and energy.

Example 3. Some cities buy all their supplies from one jobber. Others buy from many jobbers and producers. In the latter case, shipments may be coming in at many different times. If the purchases are made f.o.b. shipping point, and the deliveries of materials direct to school buildings are by hired trucking service, the expense of delivery becomes unduly large. In the former case, deliveries can be made at one time and with less cost, but in the latter case more efficient buying results.

Example 4. Engelhardt and Engelhardt† say, "Varied practices

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* Taylor, R. B. Principles of School Supply Management. Bureau of Publications, Teachers College, Columbia University, 1926.

† Engelhardt, N. L. and Engelhardt, F " Public School Business Administration," page 698. Bureau of Publications, Teachers College, Columbia University, 1927.

are followed in the distribution of supplies to school units and within buildings. The storeroom facilities within the building and classroom will be determined largely by the local organization of supply delivery and control. Each system must carefully check the organization, the cost of service, the overhead, and the space and equipment used in order to justify the plan of operation."

Example 5. The stores staffs frequently complain that it is very difficult to educate principals and teachers to follow any kind of uniform systematic procedure which assures better control of supplies. A number of cities, among which are Rochester, Cleveland, and St. Louis, have been able to adopt and apply very definite procedure with success.

Example 6. This seems to make the answering of the questions concerning stores procedure almost an individual task with each city. Yet there are general principles which can be found to apply to all systems. The study of the individual city should be mainly to discover the exception to the general rules or principles. Engelhardt and Engelhardt* state further, that as a rule supplies should be delivered directly to the storehouse, and that identical principles apply in the management of stores irrespective of the size of school systems.

Example 7. Taylor† in his chapter summaries gives an extensive list of principles of school supply management, which are of great help in setting up stores procedure. However, it is entirely possible that some of these principles will not apply in the individual case. It costs less for delivery, naturally, if deliveries are made annually to buildings, and it lessens the volume of the bookkeeping work very noticeably, but in practice it furnishes a much poorer control of the distribution of supplies according to allotments. In practice those cities which desire good control of distribution distribute supplies from a central storehouse monthly, weekly, or when needed. From an accounting and an efficiency standpoint this is the better method. It remains for cities to discover whether the money saved by better control pays for the additional cost of distribution. Even if it does not, the factor of more efficient business management is to be considered. In spending public funds accounting control must be maintained regardless of cost. As an auditor of government accounts may spend two hundred dollars to find an error of two dollars, and as the United States Post Office accounts for each stamp, so the public schools should be efficient in their procedure in following up the disposition of every unit of supplies.

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* Engelhardt, N. L. and Engelhardt, F. " Public School Business Administration," page 699. Bureau of Publications, Teachers College, Columbia University, 1927.

† Taylor, R. B. Principles of School Supply Management. Bureau of Publications, Teachers College, Columbia University, 1916.

Examples could be given ad libitum to portray favorably or unfavorably almost every conceivable kind of stores procedure. It seems evident that examples can be used to show diversity of practice, but before conclusions are drawn based on examples, many cases must be taken into consideration as well as the many variable factors.

The problem of Stores in the Commercial Field. Owing to the nature and purpose of the profit-making organization, the stores inventory is an essential part of the assets, which in turn are an essential part of the profit and loss statement and balance sheet. Both in school administration and in the commercial field the stores cards are always priced at cost. In the commercial field, however, the ten days cash discount, etc., should never be taken off the figures, but credited as an earning to the financial department. But school business exists to render service and not to earn money; therefore the cash discounts, etc., should be deducted before the unit price is computed. However, the earnings due to taking advantage of cash discounts can be kept as a book record as an index of efficiency.

In the commercial field the cost or market price (whichever is lower) is used for the purpose of the profit and loss statement and the balance sheet. A reserve account for inventory decline is maintained to account for the loss in value of stock on hand due to decline in prices. However, the use of the market price or the last purchasing price for costing purchases is not entirely standardized. This problem does not concern school business administration, since the goods are distributed and charged to the cost account at the actual cost of purchase. The inventory records are kept at the cost value also. This simplifies the problem for school stores accounting considerably.

The purpose of showing and admitting these differences between school stores and commercial stores is to show the principles of commercial stores accounting found by experience to be valid which can be applied in solving common problems. Somewhat condensed, the advantages and disadvantages of continuous stores records, as stated by Dohr*, are given here.

The Advantages of Continuous Stores Records.

1. The stores record system aids in the preparation of statements. The statements can be prepared with greater frequency and greater accuracy.
2. The system avoids delay in manufacturing. (In schools, it
3. The stores record system assists in the proper ordering of goods. avoids delay in the distribution of needed supplies.)
4. The system aids in purchasing.
5. The system reduces stores expense. (It keeps the stock on hand at a minimum necessary for good management, thus avoiding the investment of capital in unproductive stock.)
6. The stores record system establishes accountability for stores.
7. It assists in establishing selling prices. (In schools, allocation of exact cost.)
8. Through reservations the system assists in issuing materials.
9. It aids in the adjustment of fire losses.
10. It eliminates storeroom wastes.

Disadvantages of Stores Records.

1. A large amount of clerical work is needed to keep stock cards.
2. The pricing of stores requisitions requires additional help.
3. Determination of unit prices, adjusting errors, and auditing requisitions are additional jobs not encountered when stores are not established.

In accounting for industrials, Woods† emphatically states the importance of stores as follows, "No department in any manufacturing business contributes more to its health or wealth than do the departments of stores-keeping.---All materials upon their receipt must be put into general stores - general stores being so broad in scope as to cover everything that is purchased. Not only does it include material for processing and supplies for operating, but also everything in the shape of equipment. In other words, if a new machine is bought it must first go into general stores (at least by way of record) and be held there in inventory until it is delivered to a factory over a properly signed requisition chargeable to a betterment order,---"

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*Dohr, James L. Cost Accountiug Theory and Practice, p.177ff. The Ronald Press Company, 1924.

† Woods, C. E. Unified Accounting for Industrials p.68ff. The Ronald Press Co. 1920.

Principles Governing School Stores Procedure. The following principles are set up to establish a basis to determine the work which can be done mechanically:

1. A central storehouse should be established for all size systems.
2. Standard supply lists, standard equipment lists, standard text and reference book lists must be established.
3. Except when a study of local conditions decides otherwise for definite reasons, such as marked economy in distribution, transportation difficulties, etc., all supplies should be distributed through a central storehouse.
4. When for any reason annual quotas of supplies are delivered to buildings at one delivery, a definite system should be set up to control the distribution of these supplies within the building according to the established allotments.
5. There should be a permanent continuous stock record of each different article of supplies or equipment, showing the quantity received, value of goods received, quantity distributed, value of goods distributed, balance of quantity and value on hand, averaged unit price to be charged to stores requisition, the unit price of each purchase for reference of the purchasing department.
6. All supplies should be distributed on approved requisitions only.
7. The requisitions should be checked against a control of allotment and balance available for the department or individual requisitioning.
8. The requisition should be priced from the stores record card.
9. Accurate records should be kept of consumption of supplies by grade, department, and building.

10. The original investment in stores to carry stock must be considered as a capital outlay investment. No separate fund should be set up for stores purchases. The stores account is treated as a revolving fund serving only to hold the supplies and cost until they can be distributed.
11. The unit price of supplies should be determined by dividing the cost by the number of units. Odd cents should not be carried in decimals of more than one place when extensions are made by hand. (In Indianapolis the odd cents are taken care of as follows: e.g., 12 units of a supply item are bought at a cost of $3.62. The stock record is charged for $3.60 with a unit price of thirty cents. The remaining two cents are carried in an inventory over account. Another purchase might be ten units of another supply item for $3.67. The stock record card would be charged with $3.70 with a unit price of thirty-seven cents. The remainder of three cents is carried in an inventory under account. At the end of the month the inventory over and under accounts are balanced. Watching this ballance with a little manipulation of unit prices the over and under are equalized. This enables posting the total cost of supplies on the cost records, although it may not be quite accurate on the individual item.. In the above example the unit price was equalized to the nearest cent without a great error entering. If the unit cent is equalized to the nearest mill the error will be negligible. A number of systems do not account for every cent so closely, but some scheme must be applied to account for the odd cents other than by multiplying by a fraction like seventeen two hundred and forty-eighths, if the records are to be accurate.)
12. The offices should be so arranged that the purchasing department can make use of the stock record cards to secure the last unit price paid for an article without keeping duplicate records.

THE PROBLEM OF PAYROLL PROCEDURE AND ACCOUNTING

The Work of Making the Payroll. On the authority of the payrolls about 75 percent of all school money is disbursed. The main factor in office management is the peak load of work which comes usually once a month in making the payroll, writing the pay checks, and posting the ledgers. In practice the amount of work required to care for the paying of staffs of the same size varies enormously. For example, in one city with 2800 employees the payroll is written in two hours, in another with 2200 employees it is written in three days, in another with 1,800 employees it is written in one and one-half hours. This takes into consideration the actual writing of the payroll only, including monthly salary, deductions for retirement, and net payment. In the example requiring three days, the making of absence deductions is also included. This operation is not included in the other two examples. Absence deductions* are made for ten to fifteen percent of the teachers. In these two examples this takes from one-half to one day, still leaving a wide margin of difference in the amount of time spent in preparing the payroll.

Recording Payroll Amounts in the Ledger. There is a great deal of difference in the amount of time spent in recording the personal service charges, especially instruction, in the ledgers. Some systems record separately the payment to each teacher and even subdivide that amount into as many accounts as the teacher renders types of service. This requires from one to four or five entries per teacher per month for some of the teachers to keep the cost records. Other systems having one payroll per school building make but one entry in the books for the total of the building payroll. Payroll items when properly coded will serve as a medium for cost study. As will be shown in the next chapter, if the cost by grade, by department, by subject, by building, by activity, or some subdivisions is to be made available at any time throughout the year, it will be necessary to add the amount of each teacher's salary spent in that division or classification. If the ledger records are kept only by building, to find the salary cost by grade will mean the picking out, writing down and adding of the teachers' salaries of that grade from the payroll records. Time will be saved, therefore, if the original entries are made in the finest subdivision and in the greatest detail desired. It is only by different grouping of the totals of these minute subdivisions that the other costs by activity, etc., are secured. If the posting is done systematically and mechanically to these detail accounts by teacher and type of service, the automatically accumulated totals provide the entries for the control accounts of activity and organization unit.

The following principles are set up, not to govern completely payroll procedure*, but to govern only the routine work necessary for the preparation of the payroll, the pay checks, and for recording amounts in the ledgers:

1. To avoid the peak load at the end of the payroll period the individual accounts with employees working at an hourly rate should be posted daily with the amount of time, hourly rate, the extension, and total earned to date. At the end of the payroll period the labor payroll is merely a listing of these totals.
2. The individual accounts with the employees working on a fixed salary basis should be cumulative, avoiding the writing of the names and descriptive information monthly.
3. The payrolls should be prepared in the central office.
4. If the payrolls are made with the use of mechanical equipment, which speeds up the time required to list all the names, salaries, retirement deduction, etc., the forms for principal's monthly time reports can be prepared as carbon copies without extra labor. These carbon copies can be sent to him for the entry of attendance data.

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* From a study of the few cities visited, the number of substitutes varied from seven to eleven percent of the number of regular teachers, and the number of absence deductions from none on some payrolls to fifteen percent on others. Not enough cases were included to make these figures generally applicable.

* A complete list of principles governing payroll procedure can be found on pages 621 and 628 of " Public School Business Administration," by Engelhardt and Engelhardt

5. Whenever possible, time should be saved by combining the operations which use the same figures. For example, the check, the payroll, the check register, and the individual employees' records are all made up of the same information.
6. The retirement deductions from individual salaries should be recorded in the ledgers as a cost with the total payment to the individuals against the appropriate cost account.
7. Direct contributions to the retirement fund made by the Board of Education under legal requirements and not deducted from the salaries should be recorded as a fixed charge.
8 Payments for personal services should never be in cash.
9. To avoid the cumbersome task of signing the individual checks by all the necessary officials one master check should be prepared with all the necessary signatures. It should be made payable to a duly designated official who can then issue the individual checks on his signature alone.
10. Department heads or principals should not be burdened with the financial matters of payroll procedure.
11. Payroll management should be delegated to the business office of the school system and not to members of the school board.
12. Adequate safeguards should be provided for the payment of the correct amounts due, to avoid duplicating payments, and to make padding the payroll impossible.

THE GENERAL PROBLEM OF BUDGETING AND ACCOUNTING

Lack of Uniformity and Duplication of Work. During the personal investigations made in connection with this study, two phases of accounting stood out prominently because of the lack of uniformity of practice and because of the duplication of work. The first of these phases noticed was in regard to the inadequate control of purchases in terms of need determined by standard supply lists. This phase has been discussed under the problem of purchasing.

The second phase is the method of keeping control of the budget appropriations of money to be spent, controlling allotments to the school units, and keeping complete cost records. These three tasks need to be done in every school business office. Overlooking the detail in which these records are to be kept, fairly general agreement can be obtained on the need of keeping them.

It is in the method of keeping these records that much duplication, sometimes wholly hidden, sometimes quite apparent, is found. To add to this duplication some cities have a different classification of accounts from the state, classification requiring complete double bookkeeping or statistical analysis. In two dependent cities of the seventeen cities visited, the city officials demand a report according to a classification having practically nothing in common with the accounting classification approved by the United States Bureau of Education and The National Association of Public School Business Officials, which is now quite generally accepted. This again necessitates keeping two sets of books.

Examples of Budgeting and Accounting Procedure. The following examples are given to show the general types of variations in the schemes of accounting and controlling of disbursements.

City A.

The budget is developed on the basis of cash to be spent.

The accounting department (not under control of the business manager) accounts for the appropriations set up in the budget and controls the purchase of supplies by functional classification.

The ledger controlling disbursement of funds and distribution of supplies from stores by school and subdivision of accounts is kept in the business manager's office.

City B.

The budget is set up on the basis of cash to be spent.

The control accounts are set up in accordance with the classification desired by the city officials.

Accounts are also set up to control the disbursements in accordance with the school's classification of accounts. These accounts are not kept in great detail.

Cost accounts are kept giving cost in detail. These accounts are posted with disbursements and distribution of supplies from stores, but there is no control of appropriations in these detail accounts.

City C.

The budget is set up in terms of total cost. The cash requirements are determined by subtracting the stores on hand (over the minimum stock to be carried continuously) and the estimate of money to be saved by the resignation and retiring of older and higher salaried teachers (who are replaced by younger teachers lower on the salary scale and in some cases replaced by substitutes) from the total of the budget estimate.

The ledgers serving as a control of appropriation are set up for the major classification of accounts by activity and type of school, and as day high school salaries, night school supplies, etc.

Subsidiary ledgers accumulate the items of expenditures daily by activity and type of school for the monthly posting to the control ledger.

Statistical analysis provides further cost data.

Supplies distribution is controlled by accounts giving allotments set up with the building and departments in the supply department distinct from the accounting department.

Purchases are determined monthly by requisition demands and ultimately controlled in the main control ledger kept in the accounting department which keeps only one account for supplies purchased.

Explanation of the Proposed Plan of Budgeting and Accounting. The following outline is a proposed scheme of setting up the budget, controlling disbursements, controlling allotments, and giving cost information in the most economical manner and in accord with good business procedure. It takes into account the natural interrelation of all these tasks. It avoids duplication and simplifies the procedure by combining all the records into one coherent whole.

If fifty dollars are to be used by the first grade in Building Number 1 for instructional supplies, this fifty dollars appears on the appropriation account for First Grade, Building 1, Instructional Supplies. This account controls the amount to be used by this grade and furnishes the cost record. The same fifty dollars appears in the accumulated totals for first grade instructional supplies needed for the year, and in the total of all instructional supplies needed and appearing in the budget request. In this manner the budget is the vital governing instrument of the schools, representing the estimated cost of the school program. Only in this way can the budget really represent the policy of the board. To set up the budget on a cash disbursement basis tends to deceive the public and causes a gap between the budget and the cost records.

Proposed Plan of Budgeting and Accounting for All Cities.

1. The budget is set up on a cost basis.
2. The cash requirements are determined by subtracting the stores and equipment available for distribution, prepaid expenses, and any items similarly affecting the budget, from the budget estimate of total cost.
3. The budget is presented to the board, showing the following information:
    - (a) The estimated cost by character classification with comparisons with the actual costs for at least two years.
    - (b) The estimated cost of general control subdivided into as many departments as there are in the system, as superintendent's office, assistant superintendents' offices, buildings and grounds, etc., showing the nature of the cost of salaries, supplies, travel, etc.
    - (c) The estimated cost of instructional service, shown by building, by department or grade, and nature of expense. Supervision must be treated separately, according to the type of organization.
    - (d) The estimated cost of maintenance and operation by building or site in detail to show the nature of the expense.
    - (e) Fixed charges by item.
    - (f) Capital outlay by site and item.
    - (g) Auxiliary agencies and attendance service in the detail dependent upon the activities carried on under these heads.
    - (h) The estimated cost again by activity and sub-activity, as high school, night school, kindergarten, vocational schools, etc.
    - (i) Detail statements of personal service, supply, equipment, and text book requests.

4. The appropriation ledger is set up for the accounts appearing under general control, fixed charges, auxiliary agencies, coordinate activities, and capital outlay.
5. The appropriation ledger for instructional service is set up by building, department or grade, and nature of the appropriation.
6. The appropriation accounts are all debited with the budget estimates of cost, which are the allotments to the respective accounts.
7. Each account serves as a control of expenditures in terms of the budget appropriation, but for report purposes only control accounts and their unencumbered balances need be considered. No detailed account can be permitted to exceed its allotment without a transfer of funds.
8. A statement should be made with the cooperation of the purchasing department, showing the quantity of each article needed for the coming year and the estimated cost. This amount is the same amount which appears in the budget for supplies. In fact, the list should be prepared simultaneously with the preparation of the budget.
9. The purchasing department prepares a statement during the process of budget making, showing the amount and value of supplies on hand. By means of this list and the list referred to under Step 8 the amount to be deducted from the budget estimate of cost to secure the cash requirement can be ascertained. Also at this time are determined the quantity and estimated cost of articles to be purchased and these facts posted on the article cards as a control of purchases.
10. The accounts in the ledger control all actual disbursements except the disbursements for anticipated supplies, which are controlled by the article cards.

Advantages of This System.

1. The budget items as presented to the public represent the estimated cost of the proposed program without being deflated by supplies on hand or other prepaid expenses.
2. The budget shows cash requirements.

3. The budget represents a picture of the books of account and can be transferred directly item by item to the accounts to control their respective allotments.
4. The accounts in the ledger present actual costs.
5. The purchase of supplies is controlled scientifically by the need for particular supplies.
6. Only one set of books is kept. There is no duplication by keeping appropriation control separate from cost accounts, or by keeping functional accounts for supplies.

SUMMARY

1. The amount of labor involved in keeping records is greater when repair work is done by the school maintenance staff than when it is done by contract.
2. Repair work should be done by a permanent repair staff where the size of the system warrants it.
3. Accurate cost records should be maintained to make possible ascertaining the exact cost including overhead of an article produced in a shop, or an article repaired.
4. All school systems regardless of size should maintain records of the cost of maintenance.
5. In practice the size of the school system and the amount of the purchases do not alone decide whether purchases are to be made annually or more frequently. The amount of additional work required in securing prices, writing orders, posting stock cards, and other detail work are taken into consideration.
6. The purchasing department should be advised, after the budget has been made, how much of each supply item will be needed for the coming year. The estimated cost of the quantity should have been determined in cooperation with the purchasing department.
7. An account should be kept with each vendor.
8. The advantages of continuous stores records outweigh the disadvantages.

9. The chief disadvantage of continuous stores records is the amount of clerical labor needed to keep them.
10. The chief advantages of continuous stores records are the establishment of accountability for stores, allocation of costs, and elimination of waste.
11. Purchases are usually controlled only by a lump sum appropriation, although the amount of the appropriation may have been ascertained by means of standards of use.
12. There is frequently a duplication of effort in bookkeeping, arising from keeping appropriation control and cost records separately.
13. Budgets do not always reflect the cost of operating the schools for the respective years, but show the estimated expenditures.

CHAPTER III

PRESENTATION AND EVALUATION OF WAYS OF DOING THE ROUTINE ACCOUNTING TASKS BY MACHINE

In order to decide upon the superiority of one procedure over another, the following factors should be taken into consideration:

1. The volume of work.
2. The time required to do the work.
3. The cost of equipment, labor, and forms.
4. The ease of installation and of instruction of operators.
5. The availability of information.
6. The legibility, neatness, and accuracy of the results.
7. The fatigue of employees.
8. The nature of the product.
    (a) Gives all the information necessary for good administration.
    (b) Gives no useless information.
    (c) Avoids needless steps in the procedure.

THE JOBS OF SCHOOL BUSINESS ADMINSTRATION CONSIDERED FOR THE PURPOSE OF DETERMINING THE MOST EFFICIENT MECHANICAL PROCEDURE

For convenience in evaluating the ways of doing the routine work of school business administration, it has been divided into the following tasks or jobs:

1. Budget Making.
2. Writing Purchase Requisitions.
3. Writing Purchase Orders.
4. Pricing and Making Extensions on Purchase Orders.
5. Writing Stores Requisitions.
6. Pricing and Extending Stores Requisitions.
7. Keeping Stores Inventory or Stock Records.

8. Writing Checks in Payment of Material Purchases.
9. Keeping Check Register.
10. Keeping Vendors' Accounts.
11. Keeping Invoice Register.
12. Preparing Teachers', Janitors', Clerks' Payroll.
13. Writing Payroll Checks.
14. Keeping Individual Accounts with Teachers and Other Employees Paid on a Monthly or Weekly Basis.
15. Preparing Labor Payroll.
16. Keeping Individual Accounts with Employees Paid on an Hourly Basis.
17. Keeping Job Cost Records.
18. Extending Time Slips.
19. Keeping the Books of Account.
    (a) Appropriation Control.
    (b) Encumbrance Record.
    (c) Payments.
    (d) Cost Records or Analyses.
20. Keeping Contract Ledger.

BUDGET MAKING

It was not possible to gather evidence in the field to prove or disprove the benefits derived from using the tabulating machines in preparing the budget. All but one of the five cities using the tabulating machines for budget making purposes, however, expressed their opinion that it was a great saving of time and labor.

Adding and calculating machines are invaluable in making the budget whether the tabulating machines are used or not. A question may be raised, however, regarding any possible saving in the use of tabulating machines, since in the process of determining the estimates for the next year most of the compilations may be made before the accounting department begins to function.

In a study of the speed of the tabulating machines a count was made of the cards and a record of the time kept*. This study showed

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* This study was made in the Cleveland Public Schools under the direction of Mr. Durkee.

that 6300 cards could be punched, proof-punched, sorted on four columns (four sorts) and tabulated by the equivalent of one operator in fifty-seven hours, or at the rate of about 110 cards per operator per hour for all operations. Ninety-one percent of the time was spent in punching and proof-punching the cards. If the cards are to be used for only one tabulation, it can be plainly seen that more time is spent in placing the information on tabulating cards than is required to accumulate these same facts on an adding machine. However, if the information is desired in several different groupings, once the cards are punched the succeeding tabulations can be made in 10 percent of the time required for the first tabulation.

TABLE III

COMPARISON OF THE SPEED OF TABULATING OPERATIONS BY ACTUAL COUNT WITH ESTIMATES OF SELLING AGENCIES

Operation	No. of Cards	Time in Hours	Rate— Actual Count	Rate— Agencies Estimate
Punching	6,300	26	242 per hr.	200-400* per hr.
Proof Punching	6,300	26	242 per hr.	200-400* per hr.
Sorting	6,300	1	420† per min.	400 per min.
Tabulation	6,300	4	105 per min.	110 per min.

* This figure depends on the type and amount of information recorded on the cards. The estimate and the count compared very favorably with figures secured from a number of other time studies.

† Since the cards are sorted four times for a code of four numbers, it is equivalent to sorting 25,200 cards once.

Assuming that the budget be made in the central office, the estimated cost can be secured for each account set up in the classification of accounts. A suggested classification of accounts is given in Appendix A. Cards are to be punched for each employee to accumulate the cost of personal service. With this exception one card can be punched for each building for each instructional service account set up in the classification. The supply cost for each grade, subject, or department for each building can be determined from the pupil statistics and standard supply list. The cards are coded for building, type of education (elementary, junior high, evening, vocational, adult, etc.) and classification.

The following table shows the amount of time it would take a city having 6300 detail accounts in the budget, including one account for each employee, to prepare its formal budget accumulation and analysis.

TABLE IV

TIME REQUIRED TO MAKE THE BUDGET ANALYSIS OF 6,300 ACCOUNTS

Type of Work	Hours
Punching and proof-punching	52
Sorting by major character classification. (First number of Code in Appendix A)	¼
Sorting by object classification. (Second number of Code in Appendix A)	¼
Tabulating by major character classification and object	4
Sorting by department or subject and detail. (Third and fourth number of Code in Appendix A)	½
Tabulating by major character, department and detail	4
Sorting by type of education	½
Tabulating by type	3
Sorting by building	½
Tabulating by building	3
Total	68

A city of two million would have between fifteen and twenty thousand detail accounts or tabulating cards in its budget, thus requiring about 210 hours for budget accumulation and analysis. (If the budget is to be printed, the tabulated results can be given directly to the printer, thus affecting a saving of time). This estimate is based on the assumption that accounts for maintenance be kept and costs of maintenance estimated by no more than ten divisions. If they are kept by the article repaired as shown in the classification of accounts in Appendix A, this will increase the number of accounts of each building by about one hundred and adding about ten thousand accounts to this city increase the time required by thirty or forty percent.

A city of 20,000 would require about 3,000 accounts according to the classification of accounts in Appendix A. The small city usually has fewer pupils per building, or in other words the ratio of the number of buildings to the number of pupils is greater in the small city than in the large. As a result the number of accounts in the small city is greater in proportion to its size than the number necessary in the larger city. The tabulating work in making the budget in a city of 20,000 would require about 35 hours.

The advantage of the use of the tabulating machine is not secured unless the cards are to be tabulated for several different types of reports. As has been shown before, the average speed of doing all the operations with a total of 6300 cards was 110 cards an hour. With the cards already punched, which in this case accounted for over ninety percent of the time, further sortings and tabulations to get the costs by different groupings could be done at an approximate speed of 1100 cards an hour with a four number code. It can readily be seen that the advantage of the tabulating equipment becomes apparent if the cards are to be used many times. A few large school systems and universities claim that much time is saved in the use of tabulating equipment. There are also those who doubt any such advantage even though they are using the machine. Much depends on the procedure in the individual system. The extent to which accounts are subdivided and the number of different groupings are also factors to be considered. The best but rather tedious way to determine whether there is any advantage in the use of tabulating equipment in accumulating the budget totals seems to be for the individual city interested to keep an accurate time record one year of the system in use and compare it with the tabulating companies' estimate or the actual time record of the same work done with their equipment.

If the budget is tabulated on a printing tabulator, it would be possible to use ditto carbon. In this manner at least fifty copies of the budget could be made at little or no printing cost.

Although tabulating machines have been used for general accounting for many years, the tabulating machine company did not especially recommend the use of its machine for general accounting until quite recently, following tremendous changes and improvements in the equipment. No school system, therefore, has been able yet to profit by the advantages of the latest and best equipment and methods. In many cases the installations observed failed to take into account some very obvious advantages of the machine.

Exhibit 1 shows a few of the tabulating card forms in use for accumulating budget data. Sometimes the same card which is used for expense distribution is used and in other cases entirely different cards are devised. The third and fourth cards are examples of

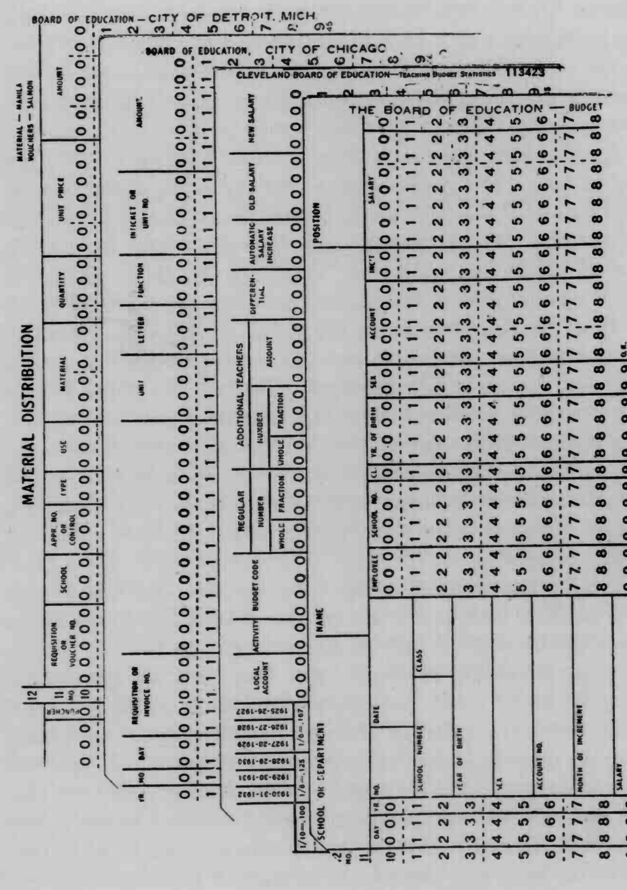

BOARD OF EDUCATION – CITY OF DETROIT, MICH
MATERIAL DISTRIBUTION
BOARD OF EDUCATION, CITY OF CHICAGO
CLEVELAND BOARD OF EDUCATION—Teaching Budget Statistics
113423
THE BOARD OF EDUCATION — BUDGET
503273

EXHIBIT 1

Tabulating Cards Used to Accumulate Budget Data

cards designed for budget purposes only. As can be seen from these same cards much other statistical information can be secured regarding personnel. Depending on the way in which the supply cards are punched they can be tabulated separately to furnish information regarding needed purchases for the purchasing department.

PURCHASE REQUISITIONS

Two types of requisitions generally used are the stores and purchase requisitions. The stores requisitions are used to request material not carried in stock. The purchase requisition is written at the source of the request, or sometimes in the central office, as a request to the city purchasing agent for the purchase of material.

When purchase requisitions are written by the various employees who have the power to requisition material, too few are written at any one source to make it profitable to employ mechanical equipment other than a typewriter. When janitors and teachers write their requests by hand with lead pencils, it is well to have the principal's clerk type them. This assures legibility and also enables the typist to refer to the writer if necessary.

Purchase requisitions written in the central office as a request for purchase by the city purchasing agent are in form identical with purchase orders and can be considered as such in studying the machine application.

WRITING PURCHASE ORDERS—PRICING AND MAKING EXTENSIONS ON PURCHASE ORDERS

Purchase orders are written in the central office. It is feasible, therefore, since all this work of a similar nature is concentrated in one place of execution, to consider the possibilities of writing orders on a machine which is particularly adapted for this work. In the smaller city where the number of orders written is not sufficient to warrant the purchase of a machine for this one purpose, the machine considered must in addition be able to do all the calculating, computing, writing and bookkeeping tasks.

TABLE V

THE APPROXIMATE NUMBER OF ORDERS WRITTEN, THE MACHINE USED AND THE TIME REQUIRED TO WRITE THE ORDERS IN A FEW CITIES

Name of City	Approx. No. of Orders Written Each Yr.	Time Required to Write the Orders	Name of Machine Used
Chicago, Ill.	50,000	7 girls, full time	Typewriter
New York, N. Y.	45,000	8 men*, full time	Moon-Hopkins
Rochester, N. Y.	22,000	1 girl, ¾ time	Underwood Fanfold
University of Michigan, Mich.	33,151	1 girl, full time	Typewriter
Milwaukee, Wis.	22,500	1 girl, with asst.	Elliott-Fisher
Johnstown, Pa.	2,200	1 girl, part time	Typewriter

* Includes making extensions and all calculations.

Differences in buying procedure cause more variation in the number of purchase orders than does the difference in the size of the cities. The smaller city following the same kind of purchasing procedure for the same educational program writes almost as many orders as the large city with the quantity of each item correspondingly less.

The work common to all purchase orders is:

1. Writing the name of the vendor.
2. Writing the name of the articles purchased.
3. Writing the quantity and unit price of each article or item.
4. Making the extension, or computing the cost of each item by multiplying the unit price by the quantity.
5. Adding the total cost of all the items.
6. Computing and subtracting discounts.

Machine Features. The use of a typewriter for writing the descriptive material of an order needs no defense. There are, however, a number of machines on the market which combine the typewriting feature with computing features. These are to be considered in terms of their adaptability for this work.

In the writing features of the different machines no difference need be considered, since they all employ standard typewriting units. In regard to the computing features there is a great difference. All the billing machines (for writing purchase orders and bills is identical) add the vertical total of the amounts of the items on the order or bill. In all cases this serves as an audit of the total amount. Only one machine, however, has the multiplying mechanism making possible the computing of the extension. Without this the billing machine does no more than copy the order as made out by hand, perhaps with the aid of a calculating machine (non-print). The only advantage the billing machine without multiplying ability has over a typewriter is that it audits the total.

The machine which computes the extension and adds the vertical total as well as computing any discounts or freight and subtracting them from the total saves at least three major steps:

1. Computing the extensions before typing the order.
2. Copying the amount on the order.
3. Auditing the calculations.

The Burroughs Moon-Hopkins is the only machine which has all these features. It saves copying the amounts on the order because the printing of calculations is automatic. Since orders only encumber available balances but do not directly affect cash, there is no need to audit the computations of the machine, which are accurate. Errors can enter only by the operator's pressing wrong keys, which is not entirely improbable, thus using the wrong unit price or quantity. The quantity figures should be checked against the original source of these figures to assure the purchase of the proper amount, but any slight errors other than this which might occur would show up either on the invoice or when the invoice is audited, thus revealing the error before the cash is paid out.

The United Multiplier and Calculator, a machine just recently placed on the market, computes and prints. However, it does not have the typewriting feature; therefore, can be used only for making extensions.

There is only one machine which does all the work shown above as common to all purchasing orders. There is no need, therefore, to make or rather no possibility of making comparisons. This machine further has the advantage, as will be seen later in the study, of being adaptable to many uses. The small system, which may not have enough orders to warrant the purchase of separate equipment to do the work of order writing, can use this machine for all the other work of general accounting.

WRITING STORES REQUISITIONS—PRICING AND EXTENDING STORES REQUISITIONS—KEEPING STORES INVENTORY OR STOCK RECORDS

Methods of Requisitioning. The routine work of writing the requisitions has already been discussed under the topic of purchase requisitions. There are a few things which affect greatly the writing of stores requisitions which need to be mentioned here. Some systems require that separate requisitions be written for each different item of supplies or equipment, some by type and use of supply, and others make no qualifying rules for requisitioning. Cleveland, Toledo, and St. Louis require requisitions written by article to fit the McCaskey Register. Detroit requires that only articles of a certain accounting classification be requested on the same requisition. This saves about half the time needed to punch tabulating cards which are used to ascertain material distribution and to group costs for entries in the ledgers. The time is saved by grouping all requisitions of the same type and punching half the card with the duplicator. The rules for requisitioning seem to be set up for the convenience of the stores and accounting departments rather than for that of the people doing the requisitioning. This principle aims to minimize the work of the central offices at the expense of the field workers.

In justice to the field workers, the teachers, principals, etc., the business office should consider the following principles in setting up or revising their stores procedure:

1. The enormous amount of labor involved in keeping stock records and pricing stores requisitions should be minimized by utilizing all possible labor-saving devices and combining all similar operations.

2. The type of requisition must conform to the needs of the labor-saving devices used, but such devices should not be adopted if they increase markedly the difficulties of writing the requisitions, or if the amount of time saved in the central office is more than lost by the additional time required of teachers and principals' clerks.

TABLE VI

AMOUNT OF LABOR INVOLVED IN KEEPING STORES IN A FEW SELECTED CITIES

Name of City	Est. No. of Items on Req. Annually	Clerks for Stores Records†	Includes Making Exten. on Req.	Text Book Records	Stock Record System	No. of Items in Stock
Cleveland	170,000	Supt. and 5 clerks	Yes—by hand	1 clerk	McCaskey Register	....
Cleveland Proposed Change	170,000	1 clerk 22 days a month	Yes—by Moon-Hopkins	Included	Unit Cards Moon-Hopkins	....
Minneapolis	100,000	4 clerks (enter only quantity)	Yes—by Moon-Hopkins	2 extra clerks	Kardex	11,000
Detroit	200,000	1 clerk‡	No	....	Unit Cards by hand	....
Pittsburgh	17,669*	2 clerks§	Yes—by hand	Hollerith	Unit Cards by hand	....

* This number represents only the number of requisitions. The number of items on the requisitions is not known.

† This includes making entries for receipt of material and entries by quantity and value unless otherwise indicated.

‡ This does not include tabulating labor. The clerk posts the stock records from tabulations of stock issued.

§ Stock records are not always posted daily, but frequently posted from hand tabulations.

Advantage of Machine Methods. The evidence presented in this table indicates that the large amount of work connected with proper stores record keeping can be greatly reduced by using proper methods and equipment.

In Cleveland six people and the superintendent of stores are occupied with keeping stores records, and pricing and extending requisitions. The accounting office in a study preparatory to changing some of its mechanical accounting equipment has decided to keep stores records in its office. The stores staff presumably will continue to function as at present. However, the accounting department proposes to keep individual stock record cards on the Moon-Hopkins machine with the work of one clerk working about eleven days a month with an additional eleven days for extending requisitions. There are approximately 11,000 stores requisitions a month and the clerk can post about 1,000 requisitions a day. This is assuming that the present method of requisitioning by article is continued. If the extending and pricing of the stores requisitions were done on the machine at the same time, all the work relative to stores record keeping would be done in this office, completely duplicating the work of the stores department, doing with one clerk on the machine what was done by six by hand. Assuming a safety margin of two clerks (in addition to the stenographer, who is not included in the six) to do the general office work of filing, sorting requisitions, etc., there would be a saving of at least one half the clerical labor.

In Minneapolis four clerks are employed in the supplies and equipment stores office and two clerks keep in a separate office textbook records. The four clerks spend all or part of their time posting the stores record Kardex cards for the quantity withdrawn. While making this entry they also copy on the requisition the unit price. The requisitions are then extended on the Burroughs Moon-Hopkins very rapidly. Since separate requisitions are not written for each article in this city, the number of the items on the requisitions has been counted. The greatest number of items extended in one hour on this machine was 563, with an average of about 350. The company estimate is one posting in twelve seconds. Previous to the use of the present machine only 100 items an hour were extended with the aid of the Comptometer. The computations are audited now with the Comptometer at triple this speed, the saving being affected by not having to copy down the figures.

In this same city the value of the stock on hand as shown by the stock record cards is obtained by inserting the Kardex cards in the Moon-Hopkins and making the extension, which is an operation similar to extending requisitions. This is done at an approximate rate of 200 inventory cards an hour.

The number of requisitions and items posted by hand by each of the four stores clerks during one month is shown here.

TABLE VII

NUMBER OF POSTINGS MADE ON THE STOCK RECORDS IN ONE MONTH

	First Clerk	Second Clerk	Third Clerk	Fourth Clerk
Requisitions..................	1366	126	1671	473
Items on the Requisitions.....	4878	247	4912	526

Only the first and third clerk spend full time posting the stock record cards and copying the price on the requisitions. The second and fourth clerks make the extensions of the requisitions on the machine, audit the requisitions, and do other routine work connected with stores record keeping.

The Moon-Hopkins makes the extensions on the requisitions at the rate of 350 to 530 items an hour. If the stock record and requisition forms were revised so that they could be placed in the machine at the same time, with the proper adjustment of the machine which is possible, the stock record could be posted at the same time at which the requisition is extended. This would save the step of copying by hand the unit price from the stock card to the requisition. It also takes care of the odd cents and fractions of cents resulting from making the extensions, by printing to the nearest cent and deducting from the value balance of the stock the money amount of the extended requisition. There will be a marked saving under this system to have separate requisitions written for each article, since this makes possible a grouping of all requisitions for the same article and necessitates placing the stock record card in the machine only once for posting all the requisitions of that article for the day.

Detroit employs only one man to keep stock records by quantity and value. This is made possible by the procedure. The requisitions are given first to the stock clerk for the entering of the unit price. They are then extended by another clerk with the aid of the United Multiplier and Calculator. Tabulating cards are punched for each different article or item on the requisition. From the tabulation of these cards by stock number the stock clerk can with one entry post all the withdrawals of a particular stock item for the day. (The tabulating cards are also coded for expense distribution and tabulated for expense ledger posting.) This method does away with the necessity of writing separate requisitions for each different item and at the same time saves the work of several clerks posting stock cards. There is a requirement, however, that separate requisitions be written for articles of different type and use as determined by the accounting classification set up. This does not greatly affect the individual doing the requisitioning since it simply demands a separation of kindergarten, elementary, music, art, etc., supplies and equipment on separate requisitions. It saves time in punching tabulating cards since, after one card is punched for the code, it serves as a model for the duplicator automatically punching the code on all succeeding cards for requisitions of the same type and use.

In Pittsburgh the text-book records are kept by means of tabulating cards. Of all the schools visited this was the only one in which tabulating cards were used as inventory records. In order to avoid the bulkiness of the mass of cards resulting when one card is set up for each unit (each book, in this case) five differently colored cards are used to signify 1, 5, 10, 50, and 100 books. This scheme cuts down appreciably the number of cards in the files. It is impossible, however, because of the nature of the installation to count the number of books on hand without separating the colors by hand. If the cards were punched to signify the difference in value, they could be run through the tabulating machine to ascertain the number of books on hand.

From actual count 110 tabulating cards can be punched, proof-punched, sorted on four columns, and tabulated per operator per hour. Since at a minimum speed the Moon-Hopkins can post twice as many items per hour, there is no saving affected by tabulating the requisition, unless the further use of the cards for cost distribution warrants it. If it is economical to use tabulating cards for cost purposes, it would be a saving, since the cards are already punched, to tabulate by stock number to cut down the number of entries necessary on the stock records. The advantage of the use of the Moon-Hopkins is further accentuated by the possibility of pricing the requisition at the same time entries are made on the stock records.

The advantage of the use of the Moon Hopkins because of speed, as shown in Cleveland and Minneapolis, is sufficient to justify its use.

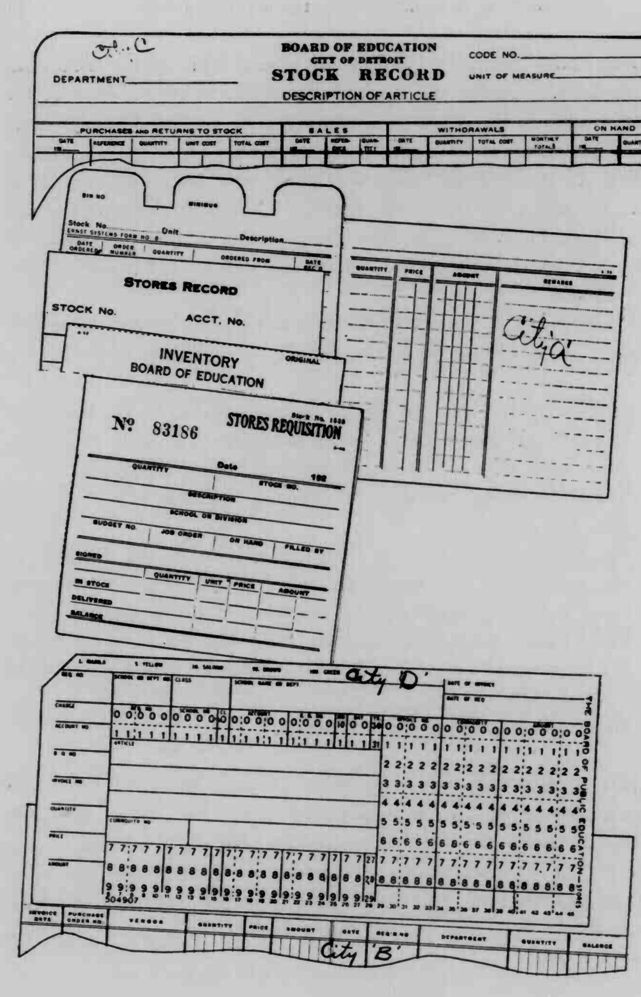
The following are some of the advantages of the Moon-Hopkins:

1. Extends requisitions at a speed three times as great as can be done with the aid of non-print computing machines.
2. Saves the extra operation of copying the unit price by hand from the stock card.
3. By inserting the stock card and requisition in the machine at the same time (not superimposed), the computing of the one entry acts as a check on the accuracy of the other.
4. Posts stock cards more rapidly than can be done by hand.
5. All printing of calculations is automatic by the depression of a single key.
6. Keeps quantity and value balances.

Exhibit 2 shows the forms in use in Detroit posted by hand and the forms in use in Cleveland adapted to the McCaskey Register. The latter consist of: the heavy folding card with the index tabs, which serves to accumulate the purchase record; the record of the physical inventory; and the stores requisition, one copy of which when properly filled out is filed in the McCaskey Register, forming the stock record.

Exhibit 3 shows, at the top, the tabulating card used in keeping the record of text-books in Pittsburgh.

The lower form is used in Minneapolis. It is the hand-posted Visible Kardex Inventory Card.



BOARD OF EDUCATION
CITY OF DETROIT
STOCK RECORD
DEPARTMENT
CODE NO.
UNIT OF MEASURE
DESCRIPTION OF ARTICLE
PURCHASES AND RETURNS TO STOCK
SALES
WITHDRAWALS
ON HAND

STORES RECORD
STOCK No.
ACCT. No.

INVENTORY
BOARD OF EDUCATION

No 83186
STORES REQUISITION

City A
City D
City B

EXHIBIT 2 & 3

Stock Record and Requisition Forms in Use in Detroit and Cleveland—Tabulating Card for Material Distribution, Tabulating Card for Textbook Record, and Kardex Stock Record Card

WRITING CHECKS IN PAYMENT OF MATERIAL PURCHASES —KEEPING CHECK REGISTER—KEEPING VENDORS ACCOUNTS—KEEPING INVOICE OR VOUCHER REGISTER

The writing of checks in payment of material purchases is a matter of copying only and involves no calculating other than the addition of the total amount of all the checks written. As a result practice varies greatly. If the writing of checks is considered as a part of all the operations dealing with the same information, it requires the use of calculating machines.

Machines Used. Most systems use a typewriter to write checks, employing the adding machine to add up the amounts of the checks. The Remington, Underwood, and Elliott-Fisher are used occasionally, and save one operation by accumulating the sum of the checks issued. Only in one of the cities visited was the Addressograph used to place the name on the checks issued in payment of materials. This machine, as is shown under payroll check writing, is frequently used to write payroll checks where the names generally follow in the same sequence from month to month. However, in making payments to vendors by means of the Addressograph, it is necessary to have plates or stencils made for the vendors from whom purchases are most frequently made. The plates, which represent the creditors for the month, must be picked out by hand from the plate files. It is claimed that even with this work, time is saved over the method of typing the name of the vendor.

Check protecting machinery is very commonly used. This requires a second duplicating operation. In some cases the amount is written on the check in lead pencil, and in other cases it is written with the typewriter or bookkeeping machine. The amounts are then rewritten by means of the check protecting machine. The value of doing this extra work as a safe-guard is questionable. Some bookkeeping machines are equipped with pinpoint type which serves the same purpose as the protecting machinery without the extra operation.

Insurance Against Changing the Amount of the Check. Another factor to be taken into consideration is the lower insurance rate of insuring checks against fraudulent changing of amounts when the checks are written with accepted check protecting machines. Although there are no facts available, it is believed that few school systems secure this kind of insurance.

Speed of Machines. There is no doubt that the speed of writing checks is greatly dependent upon the operator, but on all machine equipment good operators are expected to attain a certain speed. There is little difference in speeds between different types of bookkeeping machines used for writing checks. From an actual count in one office an operator wrote two checks a minute on the Elliott-Fisher under experimental conditions. The same operator wrote forty checks an hour, or two checks in three minutes, under actual conditions the day previous to the experimental count. This figure is an average obtained from four hours work. In another instance the Elliott-Fisher was used to write checks at the rate of 120 an hour continuously. Other bookkeeping machines, when used to write checks, averaged from 40 to 100 checks an hour.

Combining and Coordinating Records Made of the Same Information. The writing of checks in payment of materials is usually such a small part of the work of the business office that it merits little attention. Even in the larger cities it is seldom that one clerk spends half time in this work. Considering the writing of checks as a separate job the choice of machine makes little difference, but considering it in connection with other work the choice of machine makes a serious difference.

The following records are all made up of the same information which is placed on the checks:

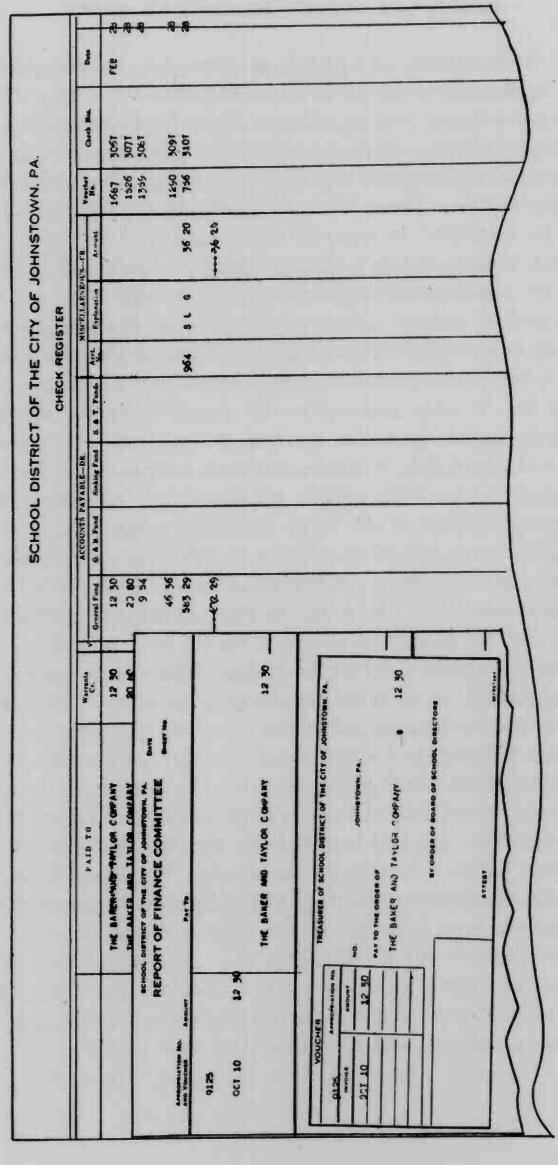
1. Vendors' accounts.
2. Check register.
3. Invoice or voucher register.

Since these records are all made up of the amount of the payment, the work of maintaining them should be combined wherever possible.

The check register very plainly is only a copy of the check and can, therefore, be made directly as a carbon copy of the check. Additional columns can be added to show fund distribution, or to show bank balances. It may be desirable, however, when unit card accounts are kept, to keep separate cards for each bank showing the fund distribution. Using this method checks for the several banks might be numbered in separate series, so that each account with the bank would serve as a check register for ready reference. Deposits are also entered on these accounts as debits.

If one check is written for each invoice, the check register automatically becomes the invoice register. This is seldom the case. Invoices from the same vendor are usually grouped under one voucher number in a voucher jacket form for payment by one check. As the check should show the invoice, or invoices, in payment of which it is issued, it is necessary to attach a remittance advice making this statement. The articles purchased may be entered on this remittance advice, but this is an unnecessary expenditure of time. The number and date of the invoice is sufficient, which enables the vendor to refer to these corresponding records if he wishes. Since the remittance advice lists the invoices, showing the date, the amount, and the vendor, copies of it should serve as entries on the vendors' accounts and the invoice register. These forms can be drawn up to fit any of the standard bookkeeping machines. The forms for use with one machine are submitted in a later chapter.

Exhibit 4 shows the forms in use in one city, adapted for use with the Elliott-Fisher Bookkeeping Machine. In this city no more than five invoices are attached to one voucher jacket. Instead of a remittance advice attached to the check, the date and amount of the invoices is entered directly on the check. A carbon of the check forms the report to the Board of Education. At the same time another carbon copy is made of the name and amount, but not the listed invoices, on the check register. In the operation of this the check register sheet moves one space mechanically after each entry, but the Report of the Finance Committee must be spaced by hand in accordance with the indicating mark on it.



SCHOOL DISTRICT OF THE CITY OF JOHNSTOWN, PA.
CHECK REGISTER
PAID TO
THE BAKER AND TAYLOR COMPANY
SCHOOL DISTRICT OF THE CITY OF JOHNSTOWN, PA.
REPORT OF FINANCE COMMITTEE
THE BAKER AND TAYLOR COMPANY 12 50
VOUCHER
TREASURER OF SCHOOL DISTRICT OF THE CITY OF JOHNSTOWN, PA.
JOHNSTOWN, PA.
PAY TO THE ORDER OF THE BAKER AND TAYLOR COMPANY 12 50
BY ORDER OF BOARD OF SCHOOL DIRECTORS
ATTEST

EXHIBIT 4

Check Register, Report of Finance Committee, and Voucher Check Written on the Elliott-Fisher

PREPARING PAYROLL OF EMPLOYEES PAID ON FLAT SALARY BASIS—WRITING PAYROLL CHECKS—KEEPING INDIVIDUAL ACCOUNTS WITH EMPLOYEES PAID ON A MONTHLY OR WEEKLY BASIS

The following statements are based on the information shown in Table VIII:

1. The principal's monthly attendance report is frequently made on a copy of the payroll which is prepared in the central office. This saves time in the principal's office, since only the absences of teachers need be entered on the payroll by the principal's clerk.
2. The Addressograph can prepare the payroll more rapidly than any other machine and can save additional time by writing the check simultaneously.
3. Printing payrolls is an antiquated and extremely costly method. It takes too long to prepare and is out of date as soon as printed. The same result is secured by using the Ditto machine at a much smaller cost in less time. The Addressograph is even more flexible, since plates can be changed each month for transfers of teachers or changes in salary, so that when the payroll is made it is up to date.
4. If the Addressograph is used in the system to write checks, it is a complete waste of money to print the payroll. The Addressograph will print the payroll while writing the checks or, if desired, print the payroll separately for use in securing absence deductions with a minimum of time and labor.
5. Except in an unusual situation, it is not necessary to rewrite the amounts on the checks by means of check protecting machines. Checks made of safety paper with the amount both written and printed is sufficient protection. A maximum amount for which the check can be written may be included as a part of the check itself as protection against an enormous change. A small alteration would not be worth the cost and would be detected as soon as the check is returned.
6. To write the payroll on a typewriter takes from five to ten times as long as to print it with an Addressograph.

TABLE VIII

TABLE SHOWING CERTAIN FACTORS IN THE USE OF MACHINES FOR WRITING PAYROLLS AND PAYROLL CHECKS

Name of City	Name of Machine	PAYROLL			CHECKS		No. of Payroll Clerks	Time Report
		Work Done	No. of Names	Time	Work Done	Time		
Toledo	Addressograph	Complete*	2,600		Name		1 full time and 3 for ¼ time	
	Electric Protectograph				Amount	10 hours		
Johnstown	Addressograph	Name only	500	None	Name, Account Name Date of payroll period	1 hour		Separate report
	Elliott-Fisher	All but name (See Exhibit 4)	500	None	Amount and date	14 hours		
Chicago	Addressograph	Name, Rate, Ret. Ded.	13,000	None	Name	2 clerks 4½ days	19	Copy of payroll
	Burroughs	Gross Sal. Ret. Red. Abs. Ded. Adjustments			All but name	3 clerks 4½ days		
Rochester	Addressograph	Complete	2,200	2 hours				Copy of payroll
Indianapolis	Typewriter	Complete	2,258	3 days			1	Separate
Clevenad	Printed	Complete	4,699	Cost $1,200			5	Copy of payroll
	Addressograph				Name and amount			
Syracuse	Addressograph	Complete	1,800	1½ hours			1 clerk 10 days	Copy of payroll
Minneapolis	Ditto	Complete biannually	3,700					
Pittsburgh	Typewriter	Written in schools Complete	4,584					
	Addressograph				Name and amount	2 days		

---

* "Complete" signifies that the name, rate, retirement deduction, net payment, etc., are placed on the payroll. Absence deductions are made by crossing out the printed amount, making necessary deduction, and writing the new amount by hand.

‡ Only two Burroughs Payroll Machines are used, but three operators are employed, one acting as relief operator to keep the machines running at top speed.

† "None" is used to indicate that this operation is included in the writing of the checks, the payroll being made as a carbon of the checks.

§ One day is spent in removing from the files those plates which represent teachers who have absence deductions and one day is spent in addressographing the checks for teachers who have had no absences.

7. In Johnstown about forty checks an hour are written. This includes writing some additional information on the payroll and making the absence deductions, but not writing the name. From a short experimental operation, however, regular checks without absence deductions were written at the rate of 120 an hour. This compares favorably with another example not given in this table, where checks are written on a similar machine including name at the rate of 120 an hour. In Chicago similar information is written on the checks and the payroll with the addition of the work of computing retirement deductions at the rate of about 200 an hour, running the machines as nearly at the maximum speed as possible by using a relief operator. Two hundred checks an hour is high speed for writing checks when making the computations and writing the payroll is included. Other machines which merely copy the amounts on the checks have a greater speed averaging from 200 to 500 an hour.

Keeping Employees Accounts. Closely allied with payroll and pay check work is the keeping of individual accounts with the teachers and other employees and the entering of the personal service costs on the ledger or cost records. Good procedure demands the keeping of individual accounts with employees. In spite of this only three of all the cities visited kept such accounts. One city of over 200,000, which maintains its own retirement system, does not even maintain records which make available the contributions of individual teachers.

Payroll, Pay Check, and Employees Account in One Operation. Considering the writing of the payroll and checks as entirely separate from all other accounting records, there is no doubt that the Addressograph is the machine which can do the work in the least time. However, to consider any of the jobs of the business department without giving recognition and attention to their relation to other jobs is poor procedure and the cause of much inefficiency in practice at the present time.

The calculations involved in making the payroll (salary, retirement deduction, absence deduction, adjustments, etc.) comprise the information which makes up the entry for the individual accounts with the employees and the remittance advice, if any is desired. Since this information is identical for three records, by means of carbon paper the three records can be made and should be made at the same time. If the retirement deduction is based on the gross salary rate and is, therefore, the same every month, there is nothing in the calculations which cannot be performed by any of the bookkeeping machines on the market. If the retirement rate involves several decimal places and the monthly contribution is based on the net salary payment, the amount of the contribution must be recalculated every month for every teacher who has an absence deduction. To make this calculation involves multiplication and can be done (that is, in conjunction with making the payroll, the check, and posting the individual account) only by the Moon-Hopkins or the special Burroughs Payroll Machine. If machines with the typewriting feature are used, the work can be done completely in one operation. If such a machine as Burroughs Payroll Machine, not the Burroughs Moon-Hopkins, is used, the checks and payroll must be named by some other method, advisedly the Addressograph. Even though the machine used may have the typewriting feature, it is frequently a saving of time to use the Addressograph to enter the names on the checks and on the payroll.

Speed of Payroll Machine. The speed of machines capable of writing the three records (payroll, check, and individual account) varies from 40 to 200 checks an hour. If the fastest machine is selected, and if three records are made at the same time, it is equivalent to making 600 entries or operations an hour, which is entirely impossible if a machine is used doing each operation separately, or if the work is done by hand. The check writer does only one half of one of the operations, placing the amount of the check.

The Addressograph can do two operations: write the check completely, and make the payroll. It is necessary, however, to write all irregular checks separately and to make the changes for absence deductions separately on the payroll. Plates for the Addressograph can also be so constructed that the amounts on the plates are interchangeable. With such plates the irregular salaries caused by absence deductions or other reasons can be entered on the plates before they are used. Another method sometimes used is that of having separate plates for names and salaries. All these methods of taking care of the irregularities in the payroll require additional time, whereas the bookkeeping machine adapted for payroll work does the job completely without need for further adjustment.

Principal's Monthly Time Report. Time can be saved if the principal is required to report only absences of teachers and not attendance. Under this procedure it is necessary, however, that he sign the payroll. When the payroll is made in conjunction with the checks and employees accounts, it is necessary to get the principal's report beforehand. If the Addressograph is used in conjunction with payroll work, a payroll can be run off and sent to the principal for his approval and adjustments. If the Addressograph is not used, the regular payrolls can be made on the Ditto or other duplicating machines, and a copy sent to the principal monthly for the absence deductions and his corrections. This will save the time of the school clerks usually required to write the time report. Many feel that when the work is distributed among so many school clerks it is not noticeable. This is poor reasoning, for the time of the principals' clerks is usually sorely needed to lessen the clerical work often loaded upon the teachers.

Posting the Salaries in the Ledgers. To enter the personal service costs in the ledger many methods are used. The total amount of the payroll may be entered in a lump sum as an instruction charge against the building account, using the payroll for any cost analysis desired. The payroll may be subdivided and posted by activity to the building account. The total amount of the payroll alone may be recorded, using tabulating cards punched for each teacher monthly or annually to get the cost distribution. In some cases tabulating cards are punched for the totals of the different payrolls and used for cost analysis. The method used greatly affects the amount of work involved. To consider totals of payrolls as the finest subdivision in the determination of costs is impossible if any comparable costs are to be obtained. To try even to approximate true costs, the time distribution and salary cost of each teacher and employee must be considered individually. This may require that the monthly salary of one teacher be allocated to several activities. Tabulating cards are sometimes used to get this minute allocation of cost.

Posting the Ledgers—A By-Product ot the Payroll. Posting the personal service costs to distribution ledgers involves again the use of the same amounts placed on the checks. It has been shown how three operations can be combined, since all are concerned with the same data. This fourth operation can also be included in a variety of ways. Assuming that the analysis of costs and budget control is desired in as great detail as the division of accounts in Appendix A shows, the operation would be as follows:

In making the payroll for Building I, for example, teachers are grouped according to the accounting classification. The checks for all the English teachers are written consecutively, then the mathematics teachers, science teachers, art teachers, etc. While the checks of the English teachers are being written the machine accumulates the total. Before the next group of checks is written the card account for "Building I, English Teachers' Salaries" is inserted and posted for the accumulated total, clearing the register for the next group of checks. This same procedure is continued for each group of teachers according to the grouping of the accepted accounting classification. If it is not desired that cost be kept by subject or activity, then the only change necessary is that after the complete payroll for the building is written, the building salary card is posted for the total, the operation being identical.

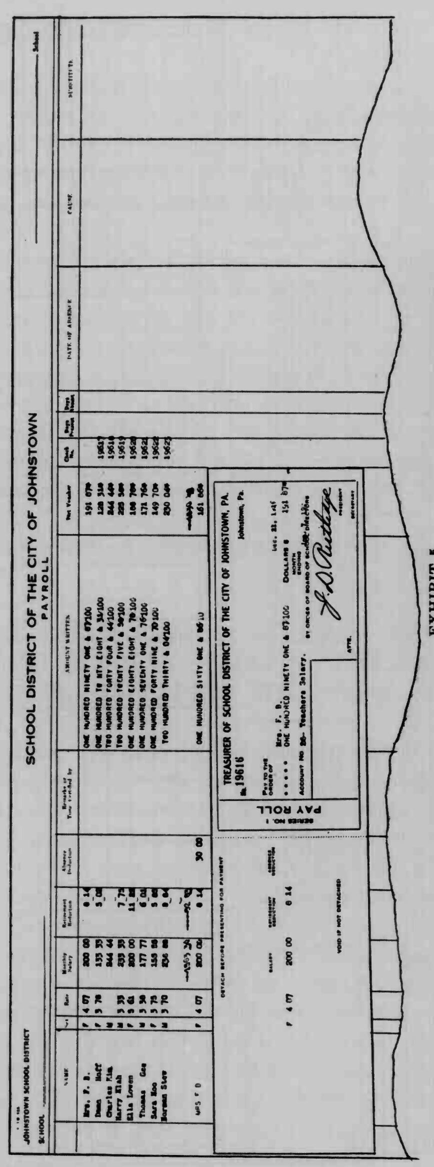
It is not quite accurate to say that four operations are being done in one since the posting of the account card is a separate step. However, the posting of these accounts is made more readily since the figures are automatically accumulated during the writing of the checks and can be placed or posted on the account card by the depression of one key. This applies only if an accumulation of cost is all that is desired. To use each of these building account cards as a control of appropriations requires a little more work and will be explained under "Keeping Books of Account."

The combining of the work of these four steps, viz., making the payroll, writing checks, keeping employees' individual accounts, and posting the ledger accounts of cost and appropriations control, with the exception of calculating retirement deductions, can be adapted to any of the bookkeeping machines on the market. Only one adaptation is shown in Chapter V.

Master Checks. Signing pay checks by three or more officials becomes a burden on unpaid school board members. This unnecessary labor should be avoided. A master check can be written for the total of the payroll, or in large cities where the activities of the schools are exceedingly numerous, master checks can be written for the payrolls of the different activities. These master checks are written to the one official in charge of the payroll and signed by all the necessary school authorities. This, then, enables the payroll official to write the individual checks, the sum total of which equals the master check or checks. His signature alone is sufficient on the individual checks, although others may be included as part of the printed check. This method not only saves the enormous amount of time required for affixing signatures and enables distributing the checks more promptly, but also makes the problem of figuring daily bank balances simpler for the school authorities and the bank. The amount of the master check is deducted from the bank balance in one operation. The bank does not have to deduct the individual checks, as they come straggling in, to figure daily balances and calculate the interest. It seems only fair that the school authorities should meet the banks halfway in this matter. If the banks are willing to pay interest on the checking accounts, the work involved in figuring daily balances and interest is much simplified by the master check. While this causes a slight loss of interest to the schools it is more than balanced by the good will secured from such cooperation as well as by the possibly higher interest rates.

Exhibit 5 shows the payroll and pay check form in use in Johnstown, Pennsylvania. In the first operation the name is Addressographed on the check and with carbon paper on the payroll. The check is then superimposed on the payroll, properly aligned in the Elliott-Fisher Machine for the entry of the amount, date, etc., and the two are written at the same time, the payroll being a carbon copy of the check.

Exhibit 6 shows the payroll form in use in Chicago. The name, gross rate, and pension rate are placed on the payroll by means of the Addressograph, and the attendance report is made as a carbon copy. The attendance report is sent to the principal for the entering of absences and other adjustments. When this is returned, it



SCHOOL DISTRICT OF THE CITY OF JOHNSTOWN

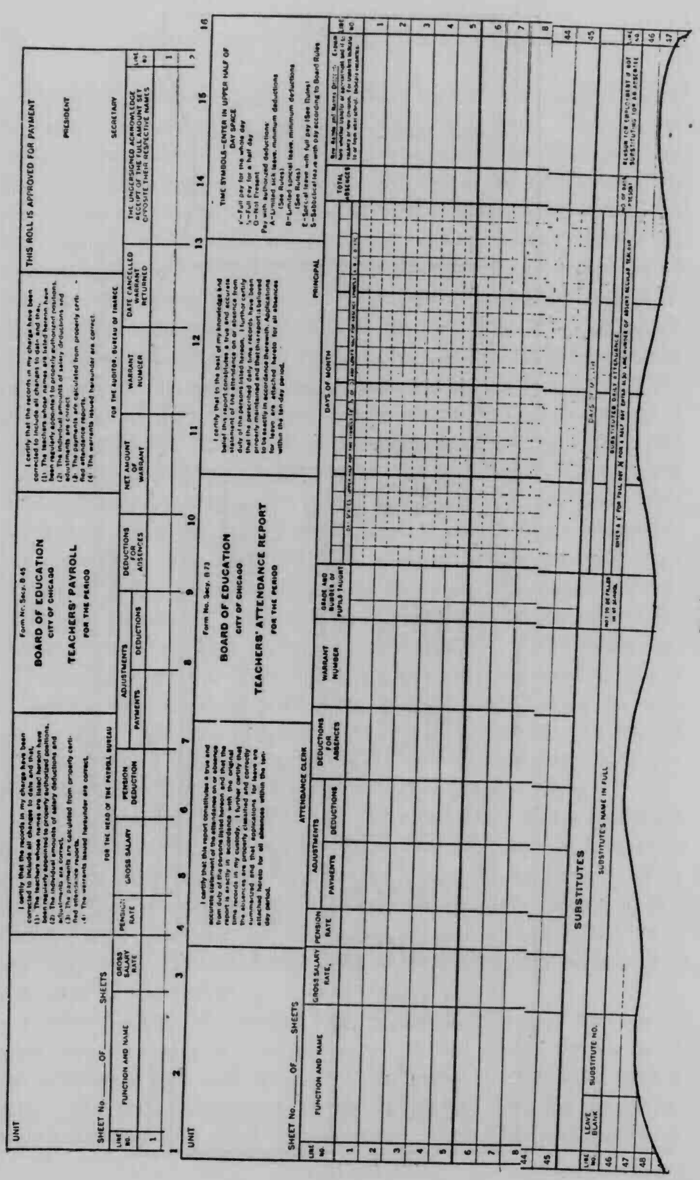
PAYROLL

TREASURER OF SCHOOL DISTRICT OF THE CITY OF JOHNSTOWN, PA.

PAY ROLL

EXHIBIT 5

Payroll and Pay Check Used in Johnstown Adapted to the Elliott-Fisher



Form No. Secy. 845
BOARD OF EDUCATION
CITY OF CHICAGO
TEACHERS' PAYROLL
FOR THE PERIOD

UNIT
SHEET No. ____ OF ____ SHEETS
LINE NO. | FUNCTION AND NAME | GROSS SALARY RATE | PENSION RATE | GROSS SALARY | PENSION DEDUCTION | ADJUSTMENTS: PAYMENTS, DEDUCTIONS | DEDUCTIONS FOR ABSENCES | NET AMOUNT OF WARRANT | WARRANT NUMBER | DATE CANCELLED WARRANT RETURNED | THE UNDERSIGNED ACKNOWLEDGE RECEIPT OF THE FULL AMOUNT SET OPPOSITE THEIR RESPECTIVE NAMES | LINE NO.
FOR THE HEAD OF THE PAYROLL BUREAU
FOR THE AUDITOR BUREAU OF FINANCE
THIS ROLL IS APPROVED FOR PAYMENT
PRESIDENT
SECRETARY

Form No. Secy. 873
BOARD OF EDUCATION
CITY OF CHICAGO
TEACHERS' ATTENDANCE REPORT
FOR THE PERIOD

UNIT
SHEET No. ____ OF ____ SHEETS
LINE NO. | FUNCTION AND NAME | GROSS SALARY RATE | PENSION RATE | ADJUSTMENTS: PAYMENTS, DEDUCTIONS | DEDUCTIONS FOR ABSENCES | WARRANT NUMBER | GRADE AND NUMBER OF PUPILS TAUGHT | DAYS OF MONTH | TOTAL ABSENCES | LINE NO.
ATTENDANCE CLERK
PRINCIPAL
SUBSTITUTES
LINE NO. | LEAVE BLANK | SUBSTITUTE NO. | SUBSTITUTE'S NAME IN FULL

Exhibit 6

Payroll Form In Use in Chicago Adapted to the Burroughs Payroll Machine

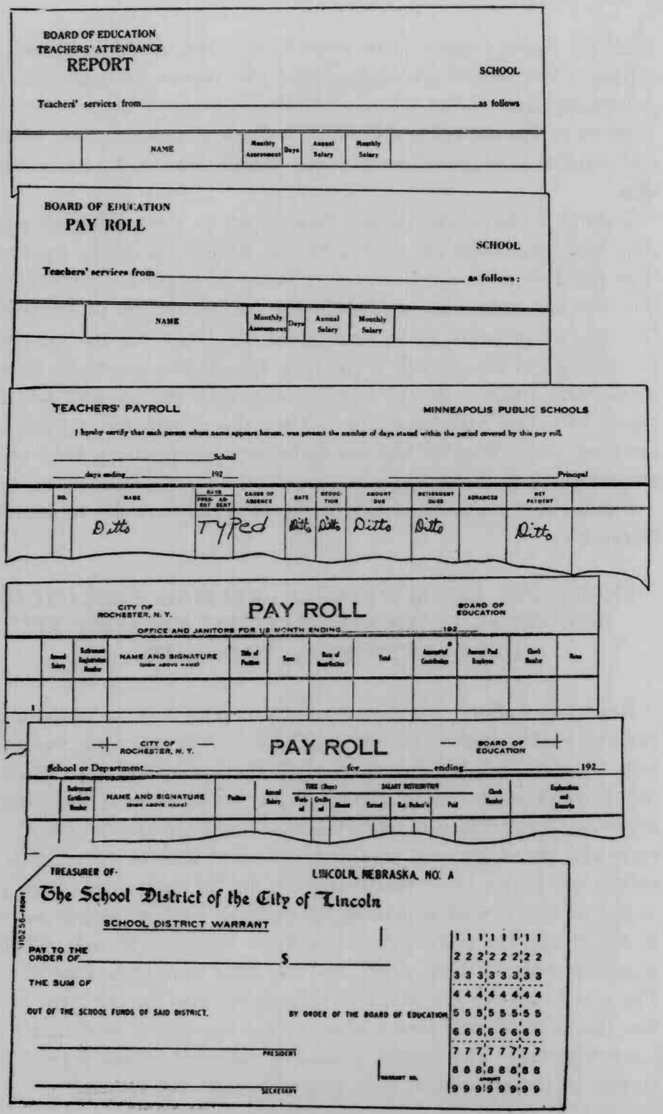
must be checked against the records of accumulated teachers' absences. The names are stamped on the checks by means of the Addressograph. After the payroll with the names already on it is inserted in the payroll machine, each check is superimposed in turn and written in conjunction with the calculations of the net amount due.

Exhibit 7 shows the payroll forms used in three different cities. The first two forms are used with the Addressograph in Syracuse. The third form is used with the Ditto Machine in Minneapolis. The last two forms are used with the Addressograph in Rochester. The general principle is the same in the use of these forms. In every case a copy of the payroll is the form sent to the principals for the attendance report. At the end of the month the payrolls are prepared with the Addressograph. After the attendance reports are received, corrections for absence deductions are made by hand or on the typewriter.

Exhibit 8 is the form of tabulating card check in use in Lincoln, Nebraska.

PREPARING LABOR PAYROLL—KEEPING EMPLOYEES INDIVIDUAL ACCOUNTS—KEEPING JOB COST RECORDS—EXTENDING TIME SLIPS

Reporting Labor. To describe the different ways of keeping job costs and labor costs is not very difficult, but to make any comparisons necessitates a careful count of all the operations. The number of jobs and the number of men employed are no index of the amount of clerical labor which must be expended to keep the records of job costs and the employees' accounts. The variation in the number of entries on the job cost records may be due to the nature of the job as well as the method of making the entries. Each employee may fill in a time slip for every job on which he works, or he may fill in a time slip daily or even weekly for his total time regardless of job. The entries on the job cost record for labor may be the total of labor, the total of each man's labor, or the amount of each man's labor every day. The routine procedure followed makes a great difference in the amount of time required to do the posting.



BOARD OF EDUCATION
TEACHERS' ATTENDANCE
REPORT

SCHOOL

Teachers' services from ______ as follows

	NAME	Monthly Assessment	Days	Annual Salary	Monthly Salary	

BOARD OF EDUCATION
PAY ROLL

SCHOOL

Teachers' services from ______ as follows :

	NAME	Monthly Assessment	Days	Annual Salary	Monthly Salary	

TEACHERS' PAYROLL

MINNEAPOLIS PUBLIC SCHOOLS

I hereby certify that each person whose name appears hereon, was present the number of days stated within the period covered by this pay roll.

______ School

______ days ending ______ 192__

______ Principal

	NO.	NAME	DAYS PRES-ENT	DAYS AB-SENT	CAUSE OF ABSENCE	RATE	DEDUC-TION	AMOUNT DUE	RETIREMENT DUES	ADVANCES	NET PAYMENT	
		Ditto	Typed			Ditto	Ditto	Ditto	Ditto		Ditto	

CITY OF ROCHESTER, N. Y.

PAY ROLL

BOARD OF EDUCATION

OFFICE AND JANITORS FOR 1/2 MONTH ENDING ______ 192__

NAME AND SIGNATURE (SIGN ABOVE NAME)

CITY OF ROCHESTER, N. Y.

PAY ROLL

BOARD OF EDUCATION

School or Department ______ for ______ ending ______ 192__

NAME AND SIGNATURE (SIGN ABOVE NAME)

TREASURER OF·

LINCOLN, NEBRASKA, NO. A

The School District of the City of Lincoln

SCHOOL DISTRICT WARRANT

PAY TO THE ORDER OF ______ $ ______

THE SUM OF

OUT OF THE SCHOOL FUNDS OF SAID DISTRICT.

BY ORDER OF THE BOARD OF EDUCATION

______ PRESIDENT

______ SECRETARY

WARRANT NO.

AMOUNT

115256—FRONT

EXHIBIT 7 & 8
Attendance Report and Payroll Forms Adapted to the Addressograph and Ditto Machine—A Tabulating Card Check

Work Required in Maintaining Job Cost Records. In Cleveland one girl keeps the job cost records, making each month about 8000 entries on 4566 job accounts. The entries for labor are made by totals of each man for each job. If the time slips, which are made by each man for each job daily, were entered instead of the totals of each man for each job, it would increase the number of entries by about 9000. One man keeps a record of the employees' time, extends the time slips, and makes the labor payroll. The following list shows the number of entries which are necessary to maintain the job cost record for one month in Cleveland exclusive of employees accounts and payrolls:

1985	Stores Requisitions
389	Purchase Orders Issued
2555	Job Orders Issued
754	Job Orders Closed
382	Purchase Orders Paid
11,000	Time Slips if entered individually (2,000 entries if entered, as now done, by totals of each man per job)
17,065	Entries Per Month for Job Cost Record---multiplied by twelve months and divided by 1900 working hours in a year gives
110	Entries Per Hour, or if time slips are entered by totals of each man per job approximately
51	Entries Per Hour (the Speed of the clerk posting by hand at the present time)

Control of Job Cost. The job cost cards are set up, as soon as the job is authorized, with the estimated amount of material and labor entered thereon. As expenditures for labor and material are made they are likewise entered with the estimated amount acting as a control. It is important that the time slips also be entered daily on the job cost records to encumber the available balance of the estimated cost. If the labor is not entered until the job is complete or only at the end of the payroll period, the cost may greatly exceed the estimated amount without proper authorization of the excess expenditure. Encumbering the job records daily will also tend to foster more accurate estimating and less waste in doing the repair work. When the estimated cost has been almost reached the foreman can be advised accordingly. If the present clerk in the example given above is working at a maximum, it would require the help of another clerk full time to enter the time slips daily by man and job, since the number of required entries would be 110 instead of 51 per hour throughout the year.

Saving Time By Using Mechanical Equipment. At a minimum speed the entries in the above example can be made on the Moon-Hopkins at the rate of 110 per hour. However, a still greater advantage can be secured by extending the time slips, posting the individual employees' accounts, and posting the job cost cards for labor in the same operation.

It requires, now, three people working continuously to do this by hand. The 6,000 monthly entries other than time slips could be made on the job cost cards by machine in about one week with one operator. The 11,000 time slips could be extended as a separate operation in eleven days. Extending these time slips in conjunction with making carbon copies for the employees' accounts and the job cost records would slow up the operation. However, if one clerk picked out the cards to be posted and arranged them in order with the entries to be made, one operator would be able to make all the entries necessary for the job cost records, as well as to keep the employees' accounts and extend the time slips. At the end of the payroll period the accumulated amounts on the individual accounts would be copied on the checks in conjunction with making the payroll. This, for less than 400 workers, would require about two days a month for one operator, assuming payment twice a month. With the exception of these two days one employee's time could be saved in this department by the use of the machine.

Exhibit 9 shows the forms in use in the University of Michigan. The employee's daily time slip and the foreman's daily time report are made out by hand and sent to the central office. In two separate operations the employee's card and the job card are posted. The entries for material on the job card are obtained from the requisitions for repair material. Entering the time and amount earned daily avoids the peak load of adding up time and computing earnings at the end of the payroll period. There is probably no saving of time in this application, but it does avoid peak loads.

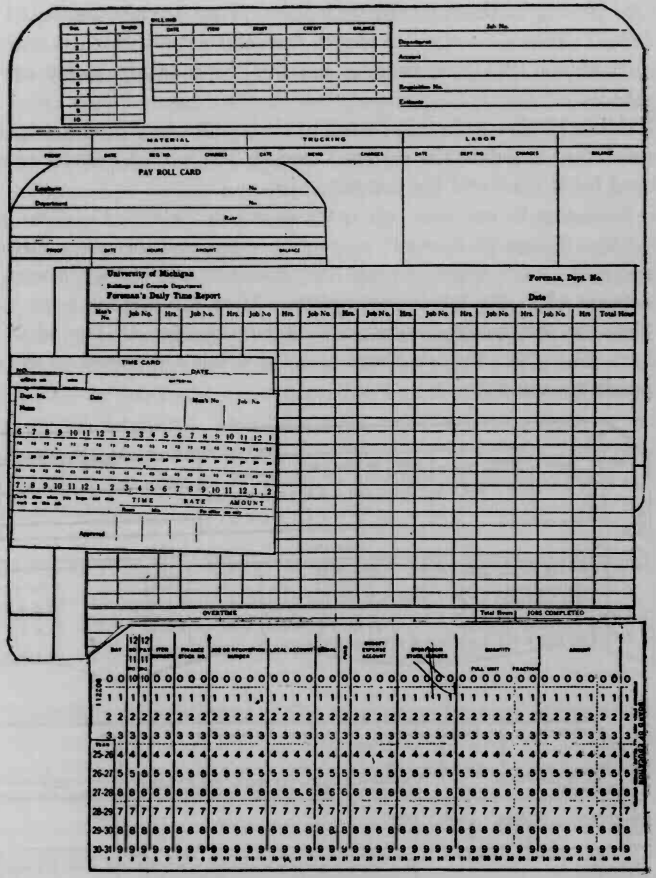


EXHIBIT 9 & 10
Job Cost Card, Payroll Card, Foreman's Daily Time Report, and Time Card Used in the University of Michigan—Tabulating Card Used to Accumulate the Material Cost of Repair Jobs in Cleveland

Cleveland uses the tabulating card to accumulate the material cost of repair jobs. Cards are punched for each requisition for each job, and when the job is completed one card is punched for the total amount of the material used as well as for the estimated amount. These cards punched for the completed job are tabulated to facilitate posting to the expenditure ledgers. They are also tabulated by budget account number to secure the information which is entered monthly on the card used in making the monthly statement to schools.

Exhibit 10 shows the card used for this purpose. A white card is used to accumulate the material used on the job. A colored card is used for the entry of the completed job.

Indianapolis uses the two cards shown in Exhibit 11. The card marked "Expense Record" is used for labor and the other card for material. Both types of cards are tabulated and posted to work in process while the job is incomplete. After the job has been completed a differently colored card is punched for all the labor on each job. Both the labor and material totals are posted to the expenditure accounts.

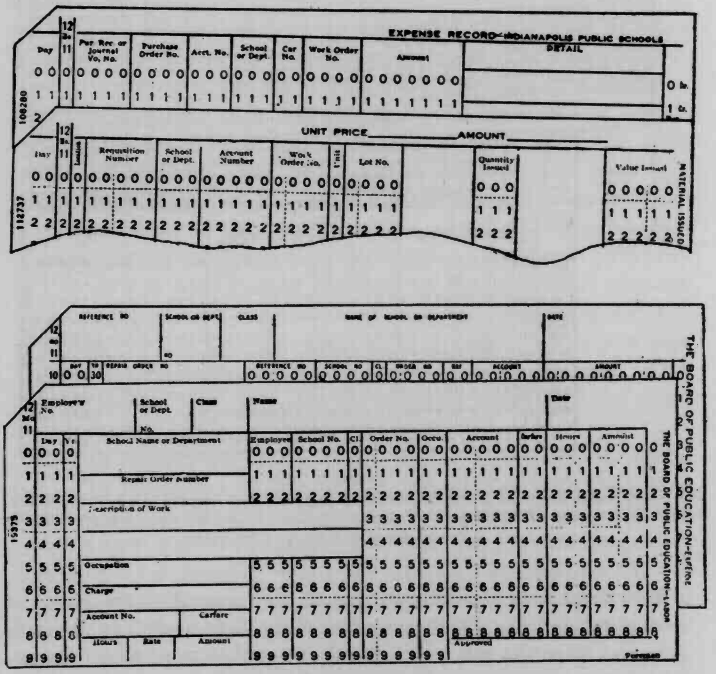

EXPENSE RECORD—INDIANAPOLIS PUBLIC SCHOOLS
Day
Pur Rec or Journal Vo. No.
Purchase Order No.
Acct. No.
School or Dept.
Car No.
Work Order No.
Amount
DETAIL
108280
UNIT PRICE
AMOUNT
Day
Requisition Number
School or Dept.
Account Number
Work Order No.
Unit
Lot No.
Quantity Issued
Value Issued
MATERIAL ISSUED
112737
REFERENCE NO
SCHOOL OR DEPT
CLASS
NAME OF SCHOOL OR DEPARTMENT
DATE
REPAIR ORDER NO
ACCOUNT
AMOUNT
THE BOARD OF PUBLIC EDUCATION—EXPENSE
Employe's No.
School or Dept.
Class
Name
Date
Day
School Name or Department
Repair Order Number
Description of Work
Occupation
Charge
Account No.
Carfare
Hours
Rate
Amount
Employee
School No.
Order No.
Occu.
Account
Hours
Amount
Approved
Foreman
THE BOARD OF PUBLIC EDUCATION—LABOR
15375

EXHIBIT 11 & 12
Tabulating Cards Used to Accumulate Labor and Material Cost in Indianapolis—
Tabulating Cards Used in Recording Job Costs in Pittsburgh

The University of Wisconsin uses tabulating cards to accumulate daily the time by man and job and the material by job for posting to the job cost card. These cards are also tabulated daily for posting to the appropriation ledger.

In Pittsburgh no job cost sheets are set up. The same information is kept, however, on tabulating cards. One card is punched for each requisition of material to the job. Two cards are punched in duplicate for the labor expended on the jobs, cards being punched for each man daily. One set of labor cards is filed by man number and one by job number. At the end of the payroll period the cards filed by man number serve to make up the payroll. Each day the cards filed by job number are tabulated by job number, and a copy sent to the foremen. This tabulation enables the foremen to see daily the standing of the jobs. Exhibit 12 shows the two cards used in recording job costs in Pittsburgh. One card is used for labor and one for material.

KEEPING THE BOOKS OF ACCOUNT, VIZ., APPROPRIATION CONTROL, ENCUMBRANCES, AND PAYMENTS
KEEPING COST RECORDS OR ANALYSES
KEEPING CONTRACT LEDGER

Controlling Expenditures. The total sum of money appropriated in the budget forms a control of the total expenditures. When this total is broken up and allocated to accounts, such as teachers' salaries, books, supplies, operation salaries and supplies, etc., a certain measure of control is obtained over the way in which the total sum of the budget is expended. When this appropriation by accounts is again subdivided by building or department, a control is secured over the amount of the budget appropriation used by each individual who receives a share of the budget. The bookkeeping is greatly affected by the degree of control desired as well as by the detail in which costs are secured.

From Table IX can be gleaned an idea of the practice of ten leading cities. Most of these selected cities do not attempt to control their expenditures by building, although they may record costs by building and account. Minneapolis keeps its control of expenditures in accord with the budget appropriation accounts. A separate office maintains the record of the allocation of cost to buildings, at the same time controlling this amount with an allotment determined by accepted standards. In this city the control of the money to be expended and the control of the allocation of funds is entirely separate.

Encumbering Appropriations When Orders Are Issued. It is generally considered desirable to encumber the available balances as soon as the purchase orders are issued. This is essential if an accurate control and equitable distribution of appropriations is to be secured. Cities using machine bookkeeping usually take this into account by entering purchase orders and payments on the accounts. A variation of this procedure is produced when, instead of recording the payments, only the amount which the invoice is over or under the amount of the purchase order is recorded. Some cities keep a register of purchase orders, others keep a copy of the order on file, to serve as a record of unpaid orders and as a record of the account with the vendors. The practice of keeping copies of the order on file as the only record of the encumbrance makes it difficult in large cities to ascertain readily the condition of accounts. In smaller cities, where the number of transactions is less than a hundred a month, it would be less confusing than in larger cities but would still represent poor practice.

Securing Detailed Cost Information. Some cities record the costs in the finest subdivision desired for reporting, while others keep their ledger records only by account and make monthly or annual classification of costs by building or department from the coded entries in the ledgers. The chief disadvantage of the latter method is the inability to control the expenditure at the point where the expenditure is made.

Machine Bookkeeping Methods in Use. To study the advantages and disadvantages of the many methods of keeping accounts and controlling appropriations it is necessary to consider each one individually. A number of methods are shown in the following pages with the forms used. A short discussion of the special features of each method is given. These discussions and examples serve to bring out some of the disadvantages that an accounting system should a-

TABLE IX

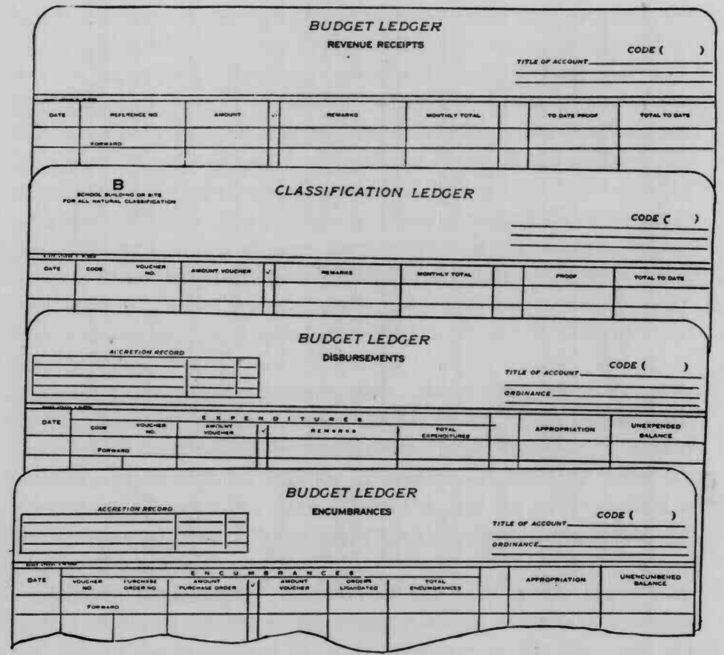
METHODS OF MAINTAINING CONTROL OF EXPENDITURES AND RECORDING COSTS IN TEN CITY SCHOOL SYSTEMS

City	Budget Control	Record of Purchase Orders	Record of Payments	Cost Accounts
Toledo (For forms see Ex. 13)	Kept by budget acct. not by bldg.	Posted to encumbrance accts. by Burroughs Bkpg. Machine	Posted to disbursement accts. Overs and unders also posted to encumbrance accts. to correct P. O. entries	One card acct. per bldg. Entries of all accts. made on this card monthly from coded disbursement accts
Johnstown (See Ex. 13)	67 accts. not by bldg.	Not kept	Recorded in 67 budget accts. by Elliott-Fisher	By bldg. without control of app. Entries made from vouchers
Chicago	Budget accts. subdivided by bldg.	Amt. of requisition posted by hand	Overs and unders of invoices posted by hand to budget accounts	Posted from inv., stores, and payrolls by hand. Same data on tabulating cards to check hand records.
Rochester (See Exs. 17 and 19)	95 accts. not by bldg.	Posted by Remington Bkpg. Mach. to 95 accts.	Payments posted to same 95 accts. making necessary corrections	Divided into 326 accts. by tabulating equipment
Indianapolis (See Ex. 20)	284 accts. All but elem. ed. by bldg.	By hand to 284 accts. Machine tabulated and posted monthly to exp. accts. as a check	Posted by hand to right hand side of exp. acct. card, on which monthly amt. of purchase orders is posted. Discounts subtracted monthly	
Cleveland	Hand posted by bldg.	Machine tabulated and posted by hand	Payments tabulated, and overs and unders only posted to budget accts.	Tabulations made monthly by bldg. to show status of accounts
Syracuse (See Ex. 16)	Not by bldg.	Entered by Underwood Bkpg. Machine	Entered by Underwood on accts. to correct orders, and coded for bldg.	
Milwaukee	Not by bldg.	Posted by hand to budget accts.	Posted to budget accts. to correct entry of orders	Analyzed by schools. (Complete record kept by city class. of accts.)
Detroit	Not by bldg.	Orders kept on file	Amounts posted by hand from vouchers to appropriation accounts	Tabulations by school and acct. posted by hand to 7,500 accts.
Minneapolis (See Ex. 21)	By bldg.	Tabulated by budget account, not by bldg.	Invoices tabulated monthly with order cards to show the status of accts. not by bldg.	Posted by hand to 4,329 accts. by building

void and some of the merits that it should embody.

Exhibit 13 shows the forms used in Toledo, which are adapted for use with the Burroughs Bookkeeping Machine. The account marked "Revenue Receipts" is not used at present, but could be if desired.

For recording expenditures there were in the original installation four different forms, of which the three now in use are shown. The "Encumbrance" and "Disbursement" accounts are set up for the accounts of the budget not subdivided by building. There is a disbursement account for each encumbrance account having the same



BUDGET LEDGER
REVENUE RECEIPTS
CODE (   )
TITLE OF ACCOUNT

DATE	REFERENCE NO	AMOUNT	✓	REMARKS	MONTHLY TOTAL		TO DATE PROOF	TOTAL TO DATE
	FORWARD							

B
SCHOOL BUILDING OR SITE
FOR ALL NATURAL CLASSIFICATION

CLASSIFICATION LEDGER
CODE (   )

DATE	CODE	VOUCHER NO.	AMOUNT VOUCHER	✓	REMARKS	MONTHLY TOTAL		PROOF	TOTAL TO DATE

BUDGET LEDGER
DISBURSEMENTS
ACCRETION RECORD
CODE (   )
TITLE OF ACCOUNT
ORDINANCE

DATE	EXPENDITURES							APPROPRIATION	UNEXPENDED BALANCE
	CODE	VOUCHER NO.	AMOUNT VOUCHER	✓	REMARKS	TOTAL EXPENDITURES			
	FORWARD								

BUDGET LEDGER
ENCUMBRANCES
ACCRETION RECORD
CODE (   )
TITLE OF ACCOUNT
ORDINANCE

DATE	ENCUMBRANCES								APPROPRIATION	UNENCUMBERED BALANCE
	VOUCHER NO	PURCHASE ORDER NO	AMOUNT PURCHASE ORDER	✓	AMOUNT VOUCHER	ORDERS LIQUIDATED	TOTAL ENCUMBRANCES			
	FORWARD									

EXHIBIT 13

Ledger Forms in Use in Toledo Adapted to Burroughs Bookkeeping Machine

title. The purchase orders, when issued, are entered in the encumbrance account. This serves to encumber the available balance of the appropriation for that account. When the invoice is received and paid, the amount is entered in the disbursement account, which is a clean slate of expenditures for that account and shows the unexpended balance. The encumbrance account shows the total of the paid and unpaid orders and the unencumbered balance. The disbursement account shows the amount of the paid orders only and the unexpended balance. Subtracting the total of the disbursement account from the encumbrance account will give the amount of the unpaid orders.

The form for encumbrances as here shown was recommended in the installation, but it is not being followed identically in practice, although it is theoretically desirable and correct. The encumbrance form is set up so that the amount of the invoice or voucher can be entered, followed by the amount of the purchase order or orders which it serves to liquidate. The difference is automatically added to or subtracted from the total encumbrances and correspondingly corrects the unencumbered balance. In actual practice the clerks ascertain the amount the invoice is over or under the amount of the order, enter it in the purchase order column, and add it to or subtract it from the total encumbrances. This variation from the form can be defended because it saves time, but on the other hand it might cause errors which would not be made when both the payment and the amount of the order are entered on the account and the subtraction made mechanically.

At the end of the month the disbursement entries, which are coded for the building allocations, are posted to the "Classification Ledger B," which consists of one account for each building. This does not serve as a control of the expenditures for that building, but it collects the entries of all accounts applicable to each building. The original installation included a "Classification Ledger A," which was also posted monthly. This latter ledger was in reality a subdivision of the "Classification Ledger B" now used showing the total for the building. It was a subdivision of the entries on the building account into accounts for the building, as "Teachers' Salaries, Building X", etc. The building account as now set up includes all of this information, but in no order or grouping. The second classification ledger was discontinued, because it was felt to be duplicate work, since seldom did any accounts contain more than one entry. For example, the present classification ledger entries might be as follows:

Teachers' Salaries	$1,289.00
Text Books	56.10
Supplies	49.20
Supplies	10.30
Janitor Supplies..........	26.00
Etc.	

The total of the building expenditure, of course, will be shown on this account posted monthly. It will not show, however, the total for supplies, or text books, or other accounts, since the entries on this account are the individual entries taken from the disbursement accounts. However, since only seldom was there more than one entry for each account for each building in "Classification Ledger B," which is the building account, setting up cards for each account for each building was merely a copying again of this entry. If there were many entries for teachers' salaries or supplies, etc., it would be necessary to group them to get the total. Since this is not the case, with one glance over the building account one can select the account for which information is desired. If there should be several entries, as in the example above where there are two entries for supplies, it will take but a moment to add them mentally or mechanically.

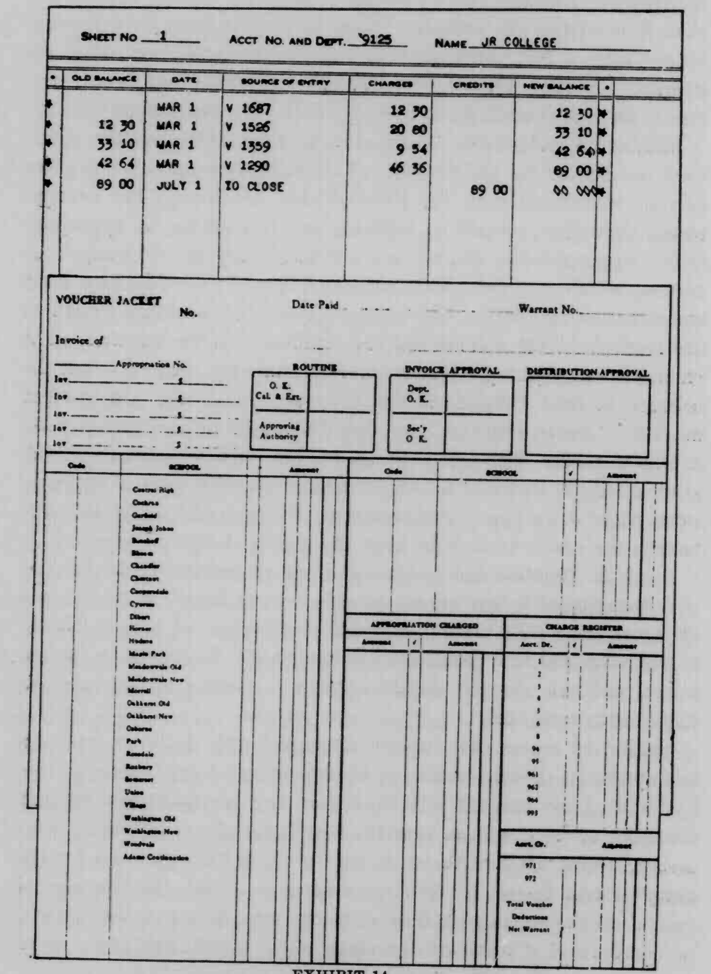
This omission of separate accounts for each building owing to the singleness of account entries for each building is stressed because it involves a saving of a great deal of labor. Another city of over a million population is contemplating making a new installation which involves the same principle. It is there proposed to keep the accounts by building posted daily. When the entries are made on the disbursement accounts a carbon copy will be made on the building accounts. This means that the entries on the building card will be made as the obligations are incurred. It will result in no order or grouping of accounts on the building card. It can be justified only by the fact that seldom is there more than one entry for each account for each building per month.

The greater the number of accounts per building the less the number of entries per account. In this city there are from 50 to 120 accounts per building and a total of about 10,000 accounts. The total number of budget entries for one month was 34,000, making less than four entries per account. Most of the accounts have but one entry, with a few, such as maintenance accounts, increasing the average. Another city of over 200,000 population has twenty-seven accounts per building and averages about five entries per account.

Exhibit 14, Johnstown, Pennsylvania, shows the voucher jacket used to make the distribution of expenditures and the expense account card used with the Elliott-Fisher Machine. The account shows only the expenditure without any control by an appropriation. Appropriation control is maintained only for 67 budget accounts, which are also posted on the Elliott-Fisher Machine on a somewhat similar form. The entries for the cost accounts by school are made from the column marked "School" on the voucher. The entries for the appropriation control accounts are secured from the column marked "Appropriation Charged." Under the column marked "Charge Register" the distribution by major character accounts is made. The amounts are posted to these accounts in the general ledger, which is set up to accumulate the total of expenditures without an appropriation control. The credit under this column is the credit to cash to keep the general ledger in balance.

Desirable practice and good accounting procedure would demand that the general ledger be set up as a control ledger of the budget appropriations. To secure equitable distribution of money, the amount allocated to a particular account should be shown on the account, and this amount should serve as a control of the expenditures in that account.

Exhibit 15 represents a unique attempt by the business manager in Johnstown, Pennsylvania, to secure annual comparisons of cost by building and account with the cost of two previous years without the labor of copying each year the cost figures for three years. Permanent forms are sometimes drawn up which have columns for the entry of cost figures for five years or more. The disadvantage of such a permanent form is that when the form is first begun there is no comparison of costs with previous years. At the end of the third year comparison of costs over three years is shown; at the end of five years a five year comparison is shown. When the form is completely filled it is necessary to start on a new form which again shows no



SHEET NO 1 ACCT NO. AND DEPT. 9125 NAME JR COLLEGE

•	OLD BALANCE	DATE	SOURCE OF ENTRY	CHARGES	CREDITS	NEW BALANCE	•
*		MAR 1	V 1687	12 30		12 30	*
*	12 30	MAR 1	V 1526	20 80		33 10	*
*	33 10	MAR 1	V 1359	9 54		42 64	*
*	42 64	MAR 1	V 1290	46 36		89 00	*
*	89 00	JULY 1	TO CLOSE		89 00	00 00	*

VOUCHER JACKET No. Date Paid Warrant No.

Invoice of

Appropriation No.

Inv. $

Inv $

Inv. $

Inv $

Inv $

ROUTINE

O. K. Cal. & Ext.	
Approving Authority	

INVOICE APPROVAL

Dept. O. K.	
Sec'y O. K.	

DISTRIBUTION APPROVAL

Code	SCHOOL	✓	Amount	Code	SCHOOL	✓	Amount
	Central High						
	Cochran						
	Garfield						
	Joseph Johns						
	Benshoff						
	Bheam						
	Chandler						
	Chestnut						
	Cooperdale						
	Cypress						
	Dibert						
	Horner						
	Hudson						
	Maple Park						
	Meadowvale Old						
	Meadowvale New						
	Morrell						
	Oakhurst Old						
	Oakhurst New						
	Osborne						
	Park						
	Rosedale						
	Roxbury						
	Somerset						
	Union						
	Village						
	Washington Old						
	Washington New						
	Woodvale						
	Adams Continuation						

APPROPRIATION CHARGED

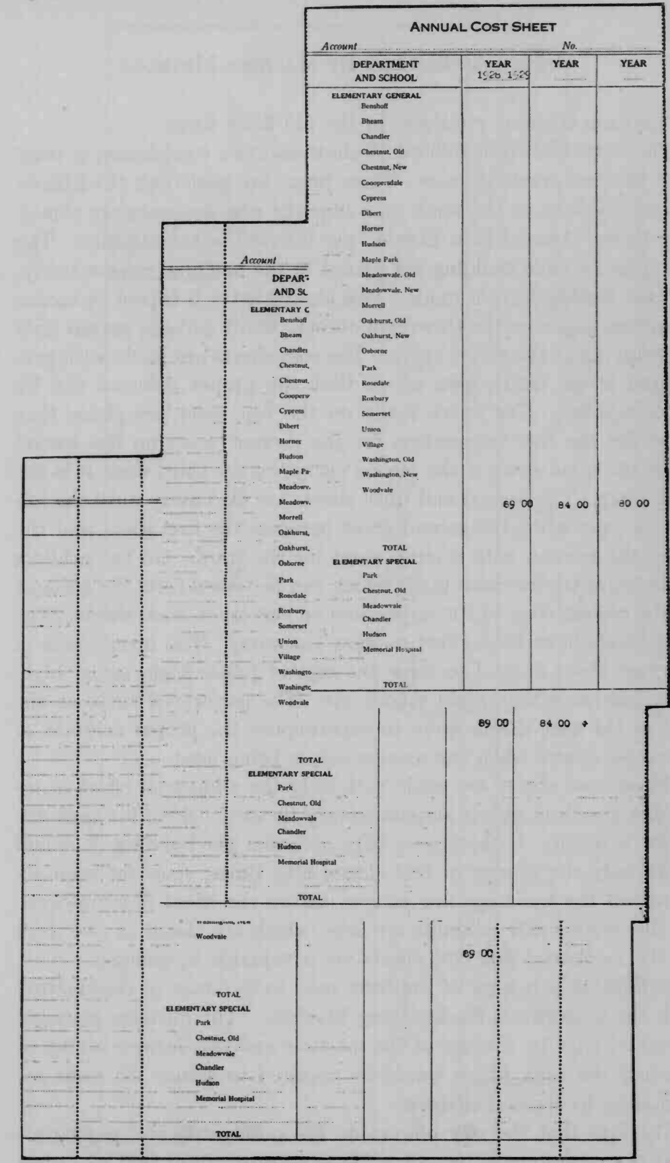
Account	✓	Amount

CHARGE REGISTER

Acct. Dr.	✓	Amount
1		
2		
3		
4		
5		
6		
8		
94		
95		
961		
962		
964		
993		

Acct. Cr.	Amount
971	
972	
Total Voucher	
Deductions	
Net Warrant	

EXHIBIT 14
Voucher Jacket and Expense Account Card in Use in Johnstown Adapted to Elliott-Fisher



ANNUAL COST SHEET

Account No.

DEPARTMENT AND SCHOOL	YEAR 1928 1929	YEAR	YEAR
ELEMENTARY GENERAL			
Benshoff			
Bheam			
Chandler			
Chestnut, Old			
Chestnut, New			
Coooperdale			
Cypress			
Dibert			
Horner			
Hudson			
Maple Park			
Meadowvale, Old			
Meadowvale, New			
Morrell			
Oakhurst, Old			
Oakhurst, New			
Osborne			
Park			
Rosedale			
Roxbury			
Somerset			
Union			
Village			
Washington, Old			
Washington, New			
Woodvale			
	89 00	84 00	80 00
TOTAL			
ELEMENTARY SPECIAL			
Park			
Chestnut, Old			
Meadowvale			
Chandler			
Hudson			
Memorial Hospital			
TOTAL			

Exhibit 15

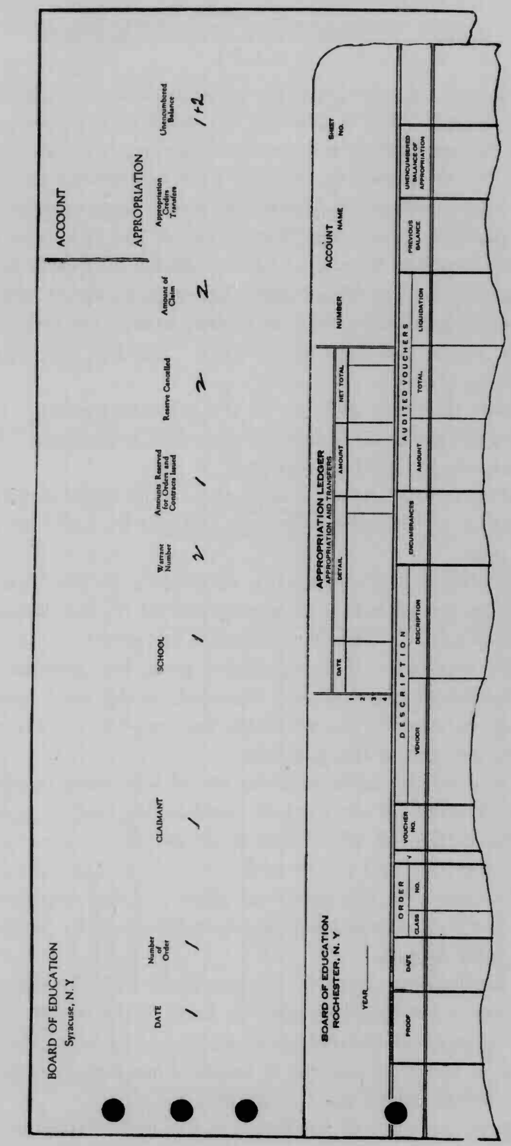
Annual Cost Sheets Showing Comparison of Costs for Three Years comparison without reference to the old filled form.

The forms shown in Exhibit 15 show always a comparison of costs with the two previous years. These forms are posted on the Elliott-Fisher Machine at the same time that the cost accounts are closed. The three "Annual Cost Sheets" are inserted in the machine. The accounts for each building are placed in the machine consecutively, and the closing entry is made. This closing entry is copied by means of carbon paper on the three cost sheets. Short carbons permit only the copying of the credit entry. The cost sheets are made with perforated strips easily torn off so that the proper columns can be superimposed. The entry made on the top sheet completes that sheet for the cost comparison for the current year; on the second sheet the same entry is the second entry; on the third sheet it is the first entry. The second and third sheets are filed away until the following year when the second sheet becomes the first sheet and the third the second, with a clean sheet for the third. On the exhibits a closing entry has been made which can be traced from the account to the carbon copy of the impression on the three cost sheets. The cost sheets have been offset to show the entry. The reverse side of the cost sheet is used to show the cost of junior high, senior high, continuation school, night school, etc. The perforated strips on the left of the cost sheets serve to superimpose the proper columns of the three sheets when the reverse side is being used.

These cost sheets are made with only the additional effort of inserting the three sheets simultaneously in the machine for each different account. If there were fifty accounts per building, it would mean only the change of cost sheets fifty times, since for each account all the buildings are entered before the sheet is withdrawn. In this system 800 accounts are kept, which are closed in two days on the machine. The cost sheets are a valuable by-product.

Exhibit 16 is a copy of the form used in Syracuse in conjunction with the Underwood Bookkeeping Machine. The business manager estimates that by the use of the machine and this form a saving of one-half the time which would be required to secure the same information by hand is effected.

The fact that the city officers do the purchasing and paying affects the procedure in recording. It is quite essential that all orders



BOARD OF EDUCATION
Syracuse, N. Y

ACCOUNT

APPROPRIATION

DATE	Number of Order	CLAIMANT	SCHOOL	Warrant Number	Amounts Reserved for Orders and Contracts Issued	Reserve Cancelled	Amount of Claim	Appropriation Credits Transfers	Unencumbered Balance
1	1	1	1	2	1	2	2		1+2

BOARD OF EDUCATION
ROCHESTER, N. Y

YEAR______

APPROPRIATION LEDGER
APPROPRIATION AND TRANSFERS

	DATE	DETAIL	AMOUNT	NET TOTAL
1				
2				
3				
4				

ACCOUNT NUMBER NAME

SHEET NO.

PROOF	DATE	ORDER		√	VOUCHER NO.	DESCRIPTION		ENCUMBRANCES	AUDITED VOUCHERS			PREVIOUS BALANCE	UNENCUMBERED BALANCE OF APPROPRIATION
		CLASS	NO.			VENDOR	DESCRIPTION		AMOUNT	TOTAL	LIQUIDATION		

Exhibits 16 & 17

Account Form in Use in Syracuse Adapted to the Underwood Bookkeeping Machine—Appropriation Ledger Form in Use in Rochester Adapted to the Remington Bookkeeping Machine

be posted against the appropriation accounts, since the bills are returned only once or twice a month. The orders are posted as soon as issued to the appropriation accounts. They are not always posted individually but are posted by totals of hand tabulations when there are a large number of orders pertaining to the same account. The entries for payments are made from a list of the bills sent to the school offices from the municipal office. About fifty such lists are received annually by the school office, representing about 4000 payments. The posting of these lists, or audits, as they are called, takes one operator about 100 days of the year. Another fifty days are spent in posting orders.

On the form shown in Exhibit 16 the columns marked "1" are filled in when the purchase orders are posted. The columns "2" are filled in when the payments are posted.

The column marked "School" is placed on the sheet to enter the name or number of the school for cost analysis by building at the end of the year.

Exhibit 17 shows the form used to maintain a current control of expenditures in accordance with appropriations on the Remington Bookkeeping Machine. The encumbrances are posted to 95 budget appropriation accounts. This operation gives the unencumbered balance. The actual payments are recorded on the same accounts, correcting the balance for the difference between the amount of the order and the amount of the payment.

The cost analyses are made with the aid of tabulating equipment. The cards in Exhibit 18 are used to tabulate the cost to make the reports shown in Exhibit 19. These cards use six columns to enter the code for character and object while the code in Appendix A supplies a classification by character and object in four columns, and in addition the four columns supply a classification by activity or department, and subject.

After the tabulations are made in accordance with the reports desired, the amounts must all be copied by hand to the report. By adjusting the report to the tabulating machine, and by using the printing tabulator, it would be possible to tabulate directly upon the final report with carbon copies made if desired.

In Exhibit 20 are some of the forms in use in Indianapolis. The

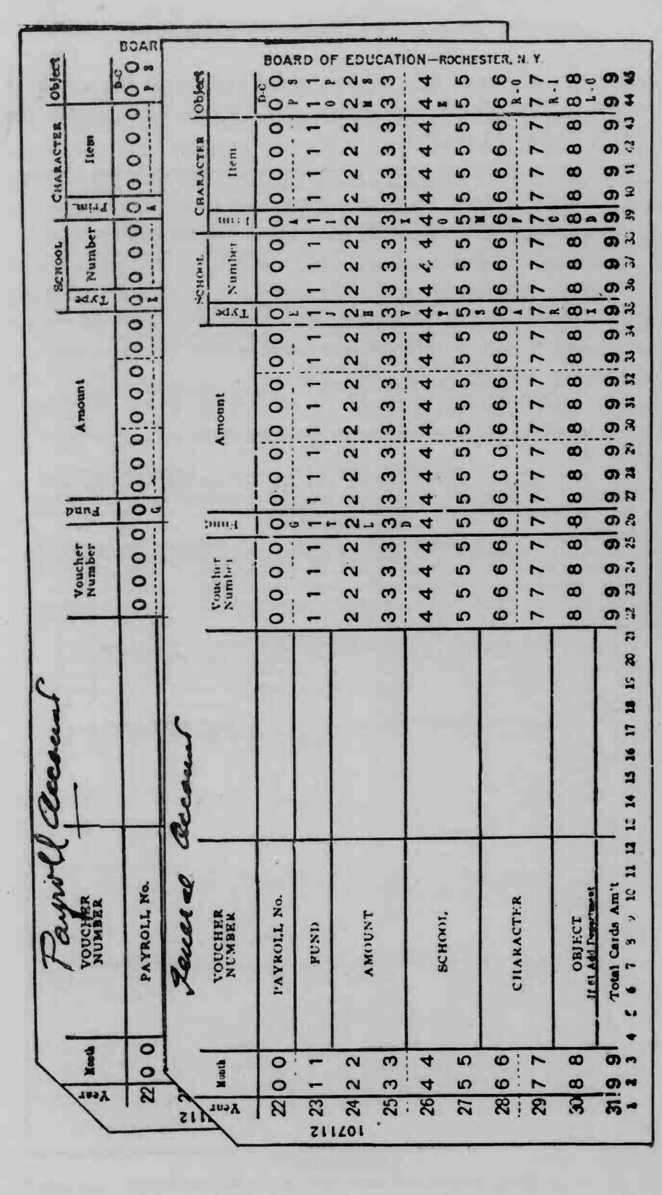


Exhibit 18

Tabulating Cards Used to Make Analyses in Rochester budgetary control card is posted by hand and forms the means of reference against which requisitions are checked to ascertain the necessary available balances.

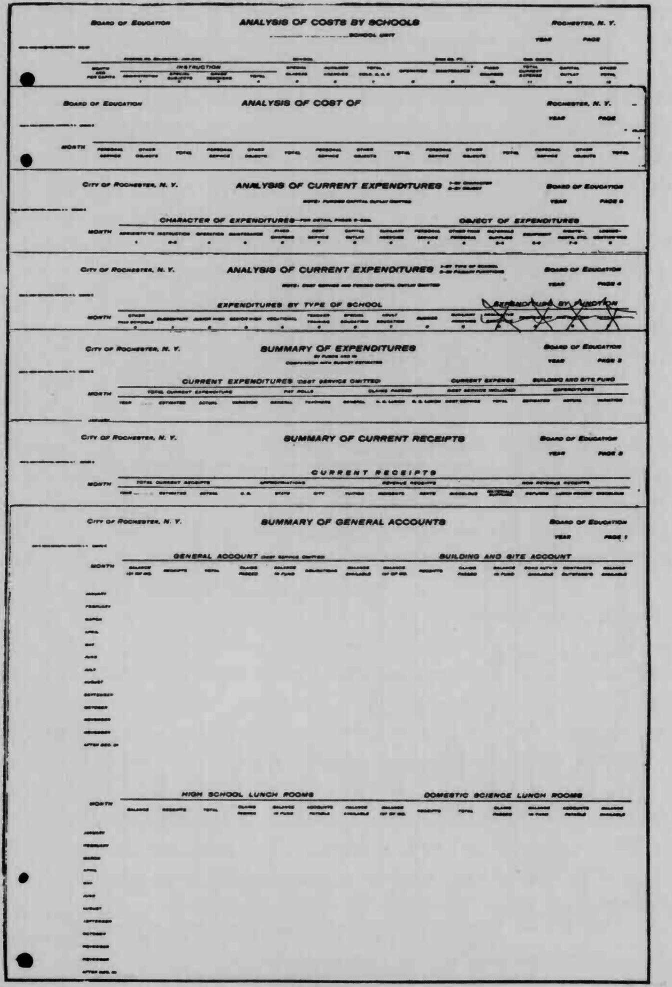

ANALYSIS OF COSTS BY SCHOOLS
ANALYSIS OF COST OF
ANALYSIS OF CURRENT EXPENDITURES
ANALYSIS OF CURRENT EXPENDITURES
SUMMARY OF EXPENDITURES
SUMMARY OF CURRENT RECEIPTS
SUMMARY OF GENERAL ACCOUNTS

EXHIBIT 19
Cost Analysis Forms in Use in Rochester

The smaller card is made up of two entries. The left-hand columns are for purchase order postings, the total of which must check with the total of the budgetary control cards. This left-hand column is posted only monthly with one entry for each account. The total for this entry is obtained from a tabulation of purchase orders punched on a tabulating card. A right-hand entry on this card pertains to actual payments. Another tabulating card is used to tabulate both payroll and purchase expense for these right-hand entries. The second card serves to accumulate the individual labor salaries and to provide a means of distributing cost of elementary education. A third card is used to accumulate the cost of material used on jobs.

Minneapolis uses the "Appropriation Record" form shown in Exhibit 21. The puchase requisitions are posted to these card ac-

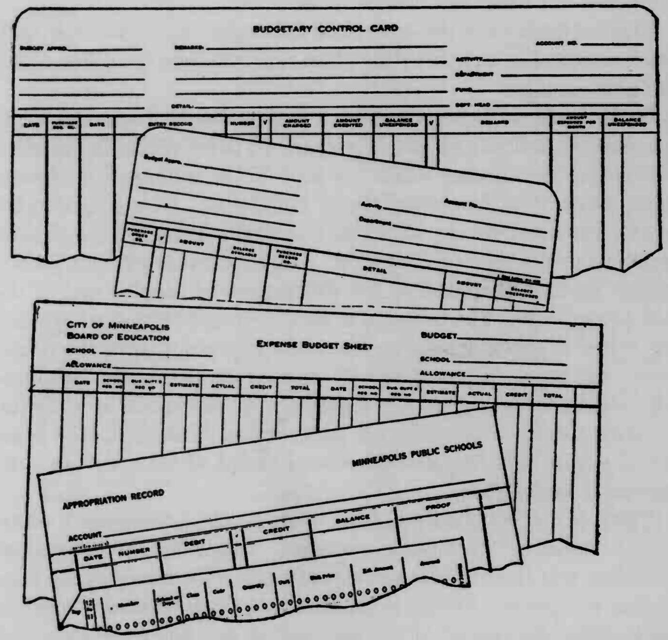

BUDGETARY CONTROL CARD
CITY OF MINNEAPOLIS
BOARD OF EDUCATION
EXPENSE BUDGET SHEET
APPROPRIATION RECORD
MINNEAPOLIS PUBLIC SCHOOLS

EXHIBIT 20 & 21
Budgetary Control Card, Cost Account, and Tabulating Cards in Use in Indianapolis— Expense Budget Sheet, Appropriation Record, and Tabulating Cards in Use in Minneapolis

counts with the aid of a Burroughs Bookkeeping Machine, before they are sent to the city purchasing agent. The need for this record of purchase requisitions arises from the fact that some time may elapse between the issuance of the requisition and the receipt of a copy of the purchase order from the city purchasing agent. When a copy of the order is received, a tabulating card is punched for the amount. Later, when the invoice is received, another tabulating card identical in form but different in color, is punched for the amount and given the same number as the order. Giving both the same number enables them to be sorted and tabulated together. The white cards, for which there are no red invoice cards on file, represent unpaid orders. The tabulating cards used are shown attached to the "Appropriation Record" card.

Exhibit 22 shows the type of monthly report made from the tabulations of the order and invoice cards.

These records form the control of the budget appropriations and are maintained in an accounting office separate from the office of the business manager.

In the business manager's office a purchase order register is kept. Invoices are audited and properly approved in his office. In his office is kept also the expense ledger. A copy of the form used in the expense ledger is shown at the top of Exhibit 21. This is posted by hand. The accounts are set up by building, making a total of 4329 accounts at the time of the study. These accounts serve as an accurate, up-to-date control of the distribution of supplies and of direct expenditure. The estimate is entered from the requisition, and the actual is also entered from the same requisition after the transaction has been completed and the amount on the requisition properly adjusted. A copy of the requisition (a requisition is made for absolutely every expenditure) is kept on file. This forms the basis for all entries and becomes an official record of all activities concerning a transaction.

There is evident duplication of effort in the accountant's office and the office of the business manager. Originally all the expense recording was done in the accountant's office by means of the tabulating equipment. Owing to the fact that the tabulations were not made daily, the control of the distribution was not up to date. In

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EXHIBIT 22

MINNEAPOLIS PUBLIC SCHOOLS APPROPRIATION BALANCE AS AT DECEMBER 31, 1928.

	Appropriation for 1928	Total Encumbrances Dec. 31, 1928	Available Balance Dec. 31	Receipts Applicable to Budget
Other than Personal Service:				
Administrative:				
Carfare	$ 12,000.00	$ 10,885.80	$ 1,114.20	$ 53.27
Library	800.00	625.47	174.53	9.73
Auto Allowance	6,132.00	6,081.45	50.55	....
Office Supplies	19,000.00	20,644.93	1,644.93*	769.44
Printing	23,000.00	19,403.49	3,596.51	1,853.94
Piano Tuning	2,734.00	2,099.85	634.15	. .
Postage	5,000.00	5,157.78	157.78*	.96
Telephone and Telegraph	16,460.00	16,590.28	130.28*	117.26
Traveling Expense	3,000.00	4,401.90	1,401.90*	238.94
Blue Prints	100.00	111.79	11.79*	2.52
Ice for Drinking Water	140.00	159.50	19.50*	11.00
Tab. Machine Rentals	1,260.00	1,260.00		. . .
Advertising	135.00	292.57	157.57*	8.00
Test and Measurement	4,600.00	5,669.74	1,069.74*	583.67
N. E. A. Convention	2,500.00	8,945.03	6,445.03*	1,430.51
Total Administrative	$96,861.00	$102,329.53	$5,468.58*	$5,079.24
Instructional Supplies:				
Academic	$ 10,750.00	$ 9,533.14	$ 1,216.86	$ 313.54
Biology	2,100.00	1,927.43	172.57	12.94
Botany	1200.00	1,135.62	64.38	7.88
Commercial	3,400.00	2,847.74	552.26	233.73
Chemistry	2,000.00	2,050.44	50.44*	44.43
Drawing	16,000	21,451.83	5,451.83*	4,309.10
Drawing Grade Text	1,250.00	1,250.00		....
General Science	2,250.00	2,006.57	243.43	
Home Economics (Cooking)	11,700.00	19,958.65	8,258.65*	7,814.67
Home Economics (Sewing)	6,930.00	16,491.11	9,561.11*	11,153.16
Kindergarten	4,750.00	4,528.99	221.01	73.09
Library Books (H. S.)	10,600.00	10,069.77	530.23	60.30
Manual Training:				
Woodworking	3,700.00	4,756.51	1,056.51*	108.86
Machine Shop	1,350.00	1,524.18	174.18*	6.00
Foundry	50.00		50.00	. .
Forge	600.00	579.04	20.96	31.76
Mechanical Drawing	4,000.00	3,770.96	229.04	35.26
Electrical Shop	4,000.00	3,363.32	636.68	21.01
Gas Engine	1.600.00	1,243.84	356.16	7.50
Sheet Metal	2,000.00	2,006.29	6.29*	105.67
Print Shop (Jr.)	1.500.00	1.589.58	89.58*	
Lumber	4,575.00	4,975.00	400.00*	468.14
Music:				
Music Supplies	750.00	661.26	88.74	3.25
Jr. and Sr. Music Book Lib.	4,000.00	4,446.62	446.62*	......
Elem. Orchestra Lib.	2,500.00	1,996.14	503.86	. . ..
Music Grade Text	6,500.00	8,590.20	2,090.20*	. .
Repairs	500.00	114.00	386.00	
Carried forward	$110,555.00	$132,868.23	$22,313.23	$24810.29

* Appropriation exceeded.

order to check the requisitions against the unencumbered balance before the requisitions were approved, the expense ledger was set up in the business manager's office. At the same time this has made possible the keeping of a cost record separate from the expenditure accounts.

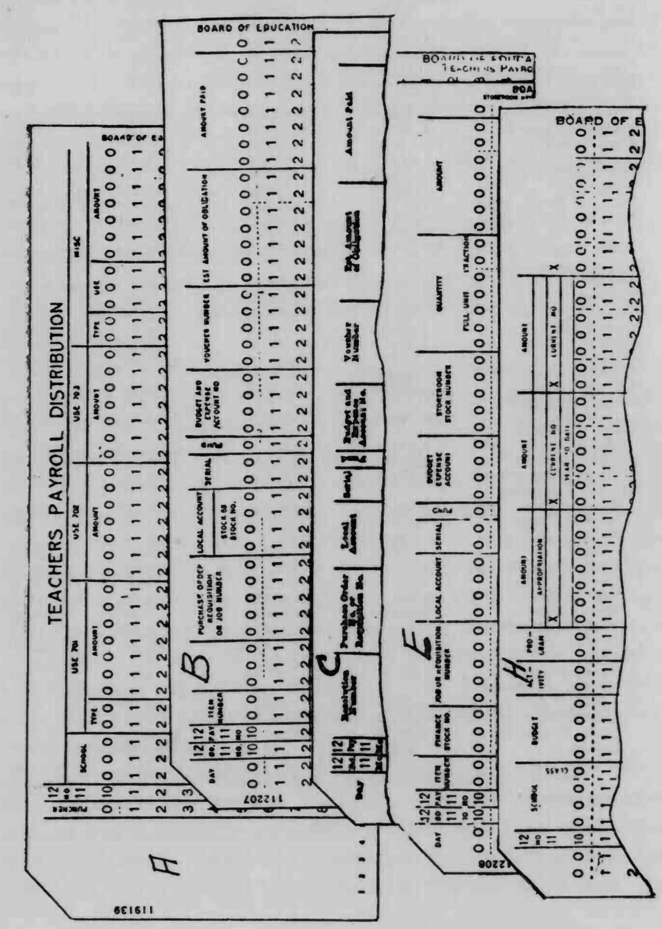
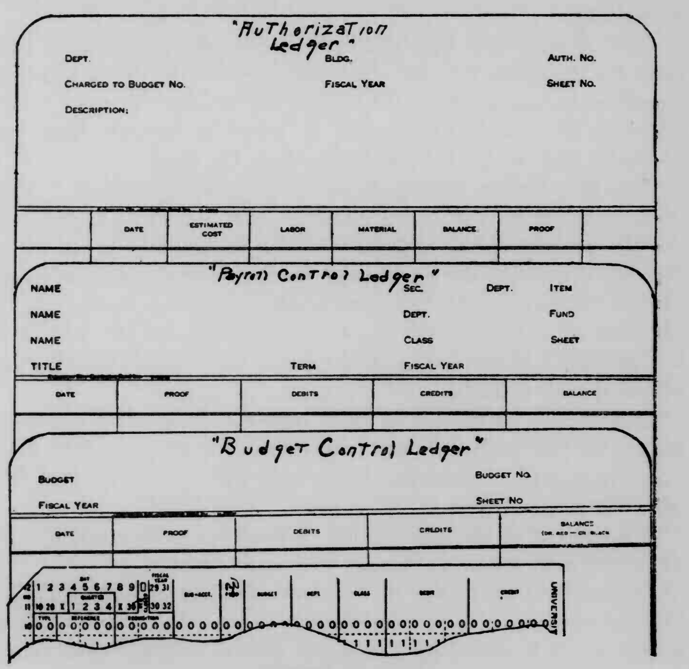


EXHIBIT 23
Diverse Tabulating Cards

Exhibit 23 is presented mainly to show variation in construction of tabulating cards for school accounting purposes. Card A is used in Detroit to tabulate teachers' payrolls. It is unique because the "USE 701, 702, and 703" sections function in the same manner as the "USE" section under miscellaneous. By separating the three most important and most frequently used code numbers referring to principal's salary, clerks' salaries, and teachers' salaries it is made impossible to enter these three amounts and one miscellaneous amount on one card. The four columns can be added at one operation during tabulating, saving at least one third of the tabulating and sorting time.

This type of card is well adapted to the use for which it is intended, since in Detroit only one card is punched for each payroll


"AuThorizaTion Ledger"

Dept. | Bldg. | Auth. No.
Charged to Budget No. | Fiscal Year | Sheet No.
Description:

	Date	Estimated Cost	Labor	Material	Balance	Proof	

"Payroll ConTrol Ledger"

Name | Sec. | Dept. | Item
Name | Dept. | Fund
Name | Class | Sheet
Title | Term | Fiscal Year

Date	Proof	Debits	Credits	Balance

"Budget Control Ledger"

Budget | Budget No.
Fiscal Year | Sheet No

Date	Proof	Debits	Credits	Balance (Dr. red — Cr. black)

EXHIBIT 24
Accounting Forms in Use in the University of Minnesota Adapted to the Dalton Machine

unless there are too many miscellaneous items. This does not permit an accurate allocation of the teachers' time, which is possible when one card is punched for each teacher for each type of teaching done during the payroll period. It is impossible to criticize the card for the use intended, but one may disagree with the use which, therefore, disqualifies the card.

The remaining cards on Exhibit 23 are used in Cleveland. Card B is used for purchase orders, the amount of which is punched in the section named Estimated Amount. Later, the exact amount is punched from the invoice in the amount paid section on the same card. Card C is used for purchases on resolutions. Card E is used for the distribution of stores direct which are not used on jobs. The material used on the jobs is accumulated and entered on a job card. The cards used to accumulate job costs have already been shown in Exhibit 10.

Cards B and C are punched both for the estimated amount and later for the actual amount. In tabulating, this results in printing together the amount of the order and the invoice, the same result which is obtained in Minneapolis by punching separate cards for the order and invoice but numbering them the same.

Card H is used in making the monthly report in one city. Three such cards are used each of a different color. One card is punched for the amount of the appropriation for the account in question. Another is punched for the amount of expenditure to date including the current month. Another card is punched for the expenditure of the current month. These cards are tabulated and the tabulated list becomes a report to the buildings and departments, showing the status of their accounts.

This practice in the use of many different cards is quite in contrast with the method in the University of Minnesota where only one card is used. It is coded, however, to differentiate between the different purposes for which it is used.

The purpose at this point is not to condemn or recommend any of the different forms, but merely to present practice.

Although the University of Minnesota uses the tabulating equipment extensively it is found necessary to set up a budget control ledger, which is posted by means of a Dalton Machine from tabulated lists of requisitions. The first form in Exhibit 24 is a job card, the second a payroll control ledger, and the third the budget control ledger. These forms are posted daily and are used as a control of the allotments to the departments. The tabulating card shown is used for all tabulatons.

The requisition closed block on the tabulating card enables sorting and tabulating open requisitions or unpaid orders. The type column is used to indicate the purpose of the card. The number of types and the number of reports made from these types are shown on pages 12, 13 and 14.

The ledger of expenditures is a loose leaf accumulation of tabulations supported by the tabulating cards filed away, which can be retabulated if necessary for verification.

The University of Wisconsin uses a similar budget control ledger form posted by means of the Burroughs Bookkeeping Machine The expenditure ledger, however, is posted by hand, which is a contrast with the procedure in the University of Minnesota where the tabulation sheets are filed in loose leaf ledgers.

Exhibit 25 is a budget statement for department number 297. The third column shows the nature of the expenditure and the fourth and fifth the expenditures and appropriation. Hand subtraction gives the unencumbered balance.

Exhibit 26 shows two similar forms for use with the Underwood Bookkeeping Machine. The appropriations can be entered as credits, but the one form is lengthened to permit more complete information concerning appropriations. These forms give at all times the amount of unpaid orders, the total amount of the disbursements and the free balance. The budget control ledgers of the University of Minnesota and Wisconsin do not given this information, since they are set up only to show the free balance, the other facts being secured from the tabulations.

All the information on these forms must be copied. The printing is not automatic. The three balance or total forward columns are necessary to enter old or previous totals in the machine for calculations. This increases greatly, however, the amount of work necessary to get the desired information. Evaluation in Chapter V will attempt to show whether this same information can be ob-

EXHIBIT 25
BUDGET STATEMENT

297	01	4		1598 13
297	02	6739	40 00	
297	07	579		5 00
297	06	16499	35 00	
297	07	16499	1 76	
297	06	17699	19 00	
297	07	51679		38
297	06	65129	2 80	
297	06	65139	115 00	
297	07	65139		15 00
297	06	65149	7 00	
297	06	66149	20 00	
297	06	68249	130 00	
297	06	68349	76 00	
297	10	18219	5 50	
297	11	17919	5 00	
297	12	623219	1 05	
297	12	623929	78	
297	12	624279	1 75	
297	13	859419	3 00	
297	13	859529	5 60	
297	13	859869	12 00	
297	13	860929	15 00	
297	13	861139	4 50	
297	13	862149	13 00	
297	13	86804	6 50	
297	14	9879	2 50	
			522 74*	1618 51*
		Balance May 31, 1927		1095 77

tained on a smaller sheet with less waste motion caused by entering so many totals forward.

It may be interesting to note the difference in size of these two forms used on the same machine. The smaller form is nineteen inches in length. The fact that this information could be placed on a nineteen inch sheet sold the machine, the competitors of which could not do the same without a twenty inch sheet. Stock size paper is thirty-eight inches wide and the nineteen inch sheet made possible cutting two sheets out of the width without any loss.

A unique ledger form is in use in the University of Michigan Hospital. This form is shown in Exhibit 27. A specially built Burroughs Machine is used for the posting. It is so constructed that an adjustment can be made daily for the date. The expense card is dropped into the holder, and the entry is always made on the line corresponding to the date. This allows very rapid inserting of cards without wasting time to make alignment. It does not seem advisable where an account has only from one to five entries a month, which is the case with school accounts. These accounts are named by means of the Addressograph.

Functions of Accounts. An objection is sometimes raised to machine forms because the entry for the actual payment is not made on the same line as the entry for the order or estimate. This objection is overcome by the expense budget sheet used in Minneapolis shown in Exhibit 21. On this form the estimate and actual cost are entered on the same line. When anyone calls the office regarding any transaction in an account, the bookkeeper can at a glance tell what the item cost and at how much it was estimated. However, in order to ascertain total encumbrances of the account it is necessary to add the total payments and, glancing through the estimates, pick out those which have not been paid or for which there is no actual entry and add this to the total payments. Subtracting this amount from the appropriation shown at the top of the account gives the balance.

Machine kept records as shown in Exhibits 13, 16, 17, and 26 do not make the entry for the payment on the same line as that on which the order, requisition, or estimate was entered. Everything is entered in chronological order. The entry of the payment of an order, which is usually termed liquidating the order, may be entered five or more lines below the entry for the order or it may be on the next sheet. It is always given the same number as the order so that reference can be made to the two entries to determine the amount of the order and the amount of the payment. This naturally takes

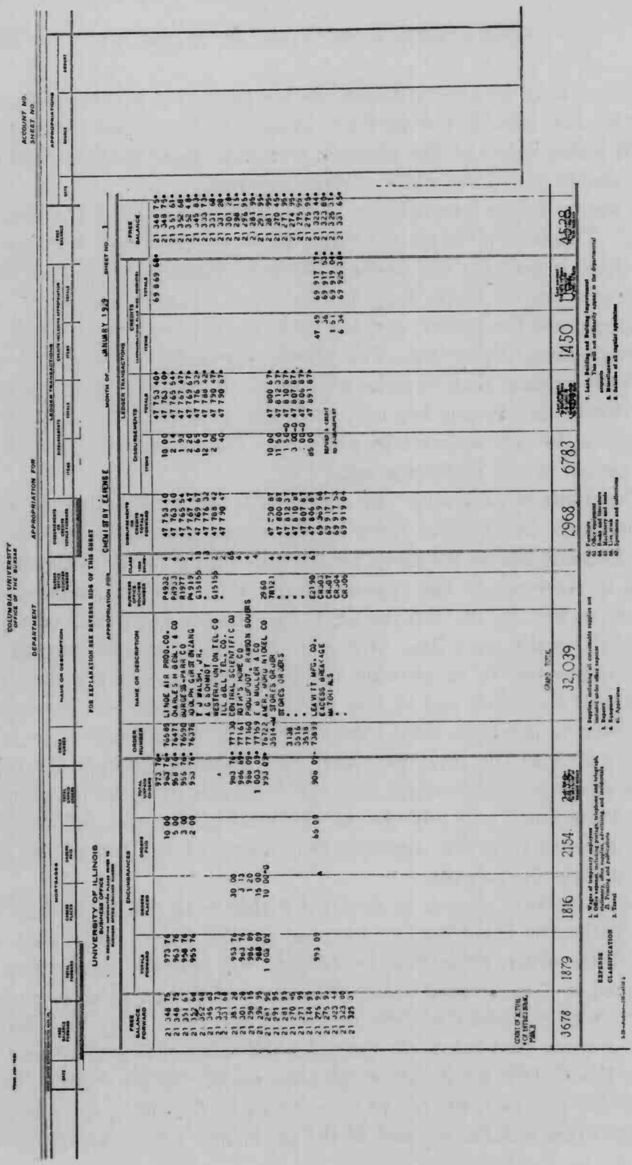


Exhibit 28

Accounting Forms Adapted to the Underwood Bookkeeping Machine

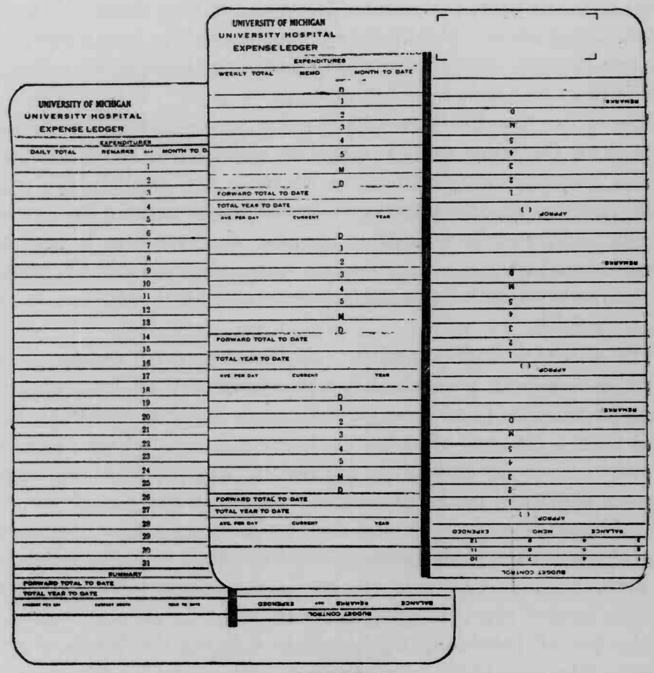

UNIVERSITY OF MICHIGAN
UNIVERSITY HOSPITAL
EXPENSE LEDGER
EXPENDITURES
DAILY TOTAL
WEEKLY TOTAL
REMARKS
MEMO
MONTH TO DATE
FORWARD TOTAL TO DATE
TOTAL YEAR TO DATE
SUMMARY
BUDGET CONTROL
EXPENDED
BALANCE
APPROP
REMARKS

EXHIBIT 27

Expense Ledger Forms in Use in the University of Michigan Hospital Adapted to a Special Burroughs Machine

a little longer than would reference if both entries were made on the same horizontal line as in the hand kept "Expense Budget Sheet" shown in Exhibit 21.

The appropriation control sheet or expense sheet controlled by an allotment should show three kinds of information:

1. The unpaid orders or estimates.
2. The total amount of payments.
3. The free balance, which is the difference between the appropriation or allotment and the sum of the payments and unpaid orders.

No bookkeeping machine on the market can make the entry for the order and payment on the same line when these two transactions do not happen at the same time and still show the above mentioned information. The hand kept records making both entries on the same line do not show the above mentioned information currently. It must be calculated when desired.

The choice then lies between the following methods: Making the entries for the order and its respective payment on the same horizontal line, furnishing convenient reference, but not having available the three types of information listed above; making the entries for the order and its respective payment wherever they happen to come chronologically, with reference to the two possible by means of the order number, and having the three types of information always available.

The answer is unquestionable. The function of an account is to show, at least, the amount of the payments and the free balance. This information is of more importance and is more frequently desired than is the need of seeing together the amount of the estimate or order and the amount of the payment of a particular transaction. Anyone concerned in the particular account can find out all the vital information without having the two entries made on the same line. In fact, even if the accounts are to be kept by hand, it would be more convenient to make the entries not on the same line if totals are desired after each day's entries.

The Use of Tabulating Equipment in Keeping the Books of Account. The work of the tabulating machines in making the analysis of the budget has already been shown. Making an analysis of cost monthly or annually is identical with making budget analysis. If the amount of the appropriation is to be shown in conjunction with the cost figure, a separate card is punched, as in Cleveland (Exhibit Card F), and tabulated simultaneously with the cost cards. To make such an analysis at any time requires the punching of as many cards as are punched for the budget, one card for the total of each account to date. The original budget cards can be used to enter the appropriation in the analysis.

Such a report will show monthly the status of each account or accounts grouped in any manner desired. However, if the accounts are to serve as a control of expenditures, the free balance must be known daily. In order to secure this information daily it is necessary to set up accounts subdivided to the extent to which control is desired. The University of Minnesota's forms used for this purpose are shown in Exhibit 24. The cards for the daily orders and invoices can be tabulated and the appropriation accounts posted from this tabulation, which is the procedure followed in Minnesota and other places following the same procedure in the use of tabulating equipment.

In a university, particularly a state university having varied activities, some of which, like agriculture, may have many business transactions daily, as the sale of eggs, milk, butter, etc., purchase of hay, grain, and other feed, the tabulating machine accumulates all the entries for one account and then one entry for the total serves to encumber the appropriation.

In public schools the subdivision of accounts is so fine that the average number of entries per account is about five per month. This would indicate that seldom would any one account have more than one entry per day. There is evidently no advantage in using the tabulating machine to total the number of entries per account in public school accounting since there is but one entry.

An installation of tabulating equipment for keeping the financial accounts of public schools should provide a means of quick and convenient reference to ascertain when desired the condition of any account without a special tabulation. This is possible. A special study of the demands of school accounting and the possibilities of the use of tabulating equipment to answer these demands is needed to show the advantages (if any) of its use. It is quite possible that the results of such a study might revolutionize both financial and child accounting methods.

Cost comparisons can be made, especially in the operation of the school plant, in order to decrease waste. Such a comparison as shown in Exhibit 28 can be made monthly and a spirit of competition instilled. If the accounts are kept in this detail by bookkeeping machines or by hand, this report does not require tabulating equipment, since the items could be copied directly from the accounts. It is true, however, that if the cards are already punched for other purposes they can then be tabulated from five to ten times more rapidly by machine than the figures can be copied by hand from the ac-

PER PUPIL COST (ON BASIS OF AVERAGE DAILY ATTENDANCE) IN INDIANA SCHOOLS DURING YEAR 1927-28 WITH COMPARISONS

ALL ELEMENTARY SCHOOLS

	Instruction (Salaries) Averaged	Janitors & Engineers Salaries	Janitors & Engineers Supplies	Fuel	Water		Repairs to Buildings	Electricity	Gas	Insurance	Telepho
Average for the City for past 2 years	$ 66.51	$5.61	$ .25	$1.49	$ .41		$4.65	$ .41	$.038	$.19	$.12
Average for the City for last year	68.63	5.35	.25	1.45	.39		3.90	.42	.035	.17	.12

EACH ELEMENTARY SCHOOL

School No.	Number of Classrooms at School	Ave. Daily Attendance at School	Year		Janitors & Engineers Salaries	Janitors & Engineers Supplies	Fuel	Water	School No.	Repairs to Buildings	Electricity	Gas	Insurance	Telephc
1									1					
2	15	485	1926-27		$8.08	$ .68	$1.57	$ .59	2	$5.00	$ .56	$.01		$.21
	15	513	1927-28		7.24	.39	1.41	.47		15.43	.50	.01	.20	.20
3	20	577	1926-27		6.66	.50	2.09	.45	3	7.08	.33	.06	.07	.10
	20	567	1927-28		6.75	.32	2.18	.53		8.72	.35	.06	.23	.10
x 4	18	470	1926-27		5.82	.36	2.31	.61	x4	5.04	.23	.01	.12	.10
	18	479	1927-28		5.42	.67	1.65	1.51		1.29	.25	.02	.18	.09
5		534	1926-27		7.64	.19	1.50	.42	5	5.26	.60	.07	.04	.18
					6.88	.15	1.34	.36		1.14	.66		.24	.18

Exhibit 28

counts. These costs are given on a per pupil basis. It would be well also to consider in the cost study the costs based on a cubiture unit for fuel, and on square feet of floor area as a unit for janitors' salaries and supplies. The type of building should be considered for all the items of operation expense.

SUMMARY

1. Many installations of machines for general school accounting purposes fail to take advantage of their possible multiple use.
2. Most schools using tabulating equipment for making the budget analysis claim that it is a marked help.
3. In general the systems using tabulating equipment show cost in greater detail than do those systems using other or no mechanical equipment.
4. Writing orders on bookkeeping machines without the computing features is merely a copying process and requires the use of separate computing machines.
5. There is only one bookkeeping machine which can be used to write orders and compute the extensions, discounts, etc., at the same time.
6. There is a great variation among several cities in the amount of time required to keep stores records of equivalent stock distribution.
7. The work involved in keeping proper stores records can be greatly reduced by using proper methods and equipment.
8. With the use of the bookkeeping machine with the computing features stores requisitions can be extended from three to five times more rapidly than with the aid of non-print computing machines.
9. Check protecting machines are frequently used for writing the amounts on checks at rates varying from 100 to 1000 an hour.
10. The typewriter is the machine most frequently used for writing the name, date, etc. on checks.
11. Bookkeeping machines used to write checks have a speed of from one to two checks a minute.
12. Printing payrolls is an antiquated method and is extremely expensive.

13. The Addressograph can prepare the payroll more rapidly than any other machine and can save additional time by writing the check at the same time.
14. A copy of the payroll is frequently used as a means of securing the principal's monthly attendance report.
15. Accounts are seldom kept with employees, only three of the cities visited keeping individual teachers' accounts.
16. Master checks are generally accepted as a time saving device in issuing payroll checks.
17. Most of the cities visited do not control expenditures by building.
18. Cities using machines for bookkeeping usually record the amount of the order as an encumbrance.
19. Copies of orders are filed in some cases to take the place of vendors' accounts.
20. Tabulating cards are used for financial accounting but in no case do they provide daily the available balances of the accounts. The daily balance, if secured, is obtained by subsidiary records posted daily.
21. Accounts should show at least the amount of the appropriation, the amount of the payments, and the unencumbered balance. It will be of occasional use to have them show the amount of the unpaid orders.

CHAPTER IV

CONCLUSIONS AFFECTING THE ADAPTATION OF MACHINES FOR GENERAL SCHOOL ACCOUNTING

Maintenance

1. A property inventory should be maintained.
2. Permanent continuous records of the amount and value of repair supplies on hand, received, and disbursed to the various jobs should be kept.
3. A requisition should be written for each repair job. Since the headings of the requisitions, job order, and job cost card contain the same information, these forms should be properly made in pads so that when the requisition is written the headings on the others are made as carbon copies.
4. A time slip should be required from each man daily for each job on which he has worked.
5. A cumulative record should be kept and posted daily showing the amount earned by each employee.
6. Labor and material cost should be posted daily to the job cost cards.

Purchasing.

7. An account should be set up with each vendor, showing the amount of the orders placed, necessary corrections from the invoices, the amount paid, and the balance due.
8. The purchases should be controlled by quantity and value.
9. There should be a catalog index showing the articles alphabetically arranged with the names of the vendors from whom they can be bought.
10. Purchase orders should be written on a machine which can be used for computing.

Stores.

11. There should be a permanent continuous stock record of each different item of supplies and equipment showing the quanti-

ty received, value of goods received, quantity distributed, value of goods distributed, balance of quantity and value on hand, the averaged unit price to be used in pricing the stores requisitions, the unit price of each purchase, and the vendor from whom purchased.

12. The stock record should further show the estimated quantity of the item needed for the ensuing year, the estimated amount on hand over the minimum at the end of the year and the amount to be purchased.
13. The requisitions should be priced and the stores ledger card posted at the same time, avoiding the necessity of separately pricing the requisitions.

Payroll.

14. The labor payroll and pay checks should be written simultaneously, the amounts of the checks being secured from the individual records of the employees.
15. The teachers' checks, the teachers' accounts, and the professional payroll should be written at the same time.
16. The teachers' accounts should show the absences to date. Since this card is inserted with the check and payroll, no further references need be made to determine whether the allotment of absences has been used.
17. The payroll should show a net cost charge figure for convenient posting to the cost accounts.

Budgeting and Bookkeeping.

18. The total of the budget should be analyzed by functional and character classification of accounts; instructional cost by building; general control by department; maintenance and operation by site or building; fixed charges by item; capital outlay by site and item; the total estimate by activity, viz., high school, night school, kindergarten, etc.; detail statements of personal service, supply, equipment, and text book requests.
19. The accounts should act as a control of distribution of supplies and equipment.
20. While posting the unit accounts, a carbon copy should be made which can serve as a monthly report to the building principal and department head.

21. Salary accounts should be posted in conjunction with the making of the payroll.
22. Control accounts should be posted in conjunction with the posting of the unit accounts.
23. The appropriation control or budget accounts should be set up in such a manner that they may serve as cost accounts.
24. Tabulating equipment can probably be used to advantage for school accounting. A special study is needed, however, to show how it can be used to the best advantage.

Payments for Material Purchases.

25. The invoices, as they are received, should be listed on the remittance advices. The invoice register should be made as a carbon copy showing general ledger account distribution.
26. The check should be written for the total of the remittance advice, making the check register as a carbon copy at the same time.

General.

27. Any machine to be practical for small school systems should be flexible enough so that it can be used for all the purposes of general accounting.

PART II

APPLICATION OF THE CONCLUSIONS OF THE STUDY IN THE DEVELOPMENT OF AN ACCOUNTING SYSTEM

CHAPTER V

A COMPLETE ACCOUNTING SYSTEM WITH FORMS DRAWN UP TO SECURE THE GREATEST POSSIBLE ADVANTAGES OF ONE BOOKKEEPING MACHINE

Texts on school administration dismiss the matter of mechanical accounting with brief comment. The customary conclusion that is given is that the use of accounting machines has certain advantages for larger systems, but that smaller systems cannot afford the outlay for equipment so little used. No effort is made to show what size city can profit from the use of such machines. It has been one of the purposes of this study to answer this question.

In the larger cities with a population over 200,000 the volume of transactions makes it feasible to use certain mechanical equipment to write purchase orders, other equipment to do the work connected with payrolls, and still other equipment to keep the accounts. There is no need to consider the multiple use of any one piece of equipment to secure efficiency. In smaller systems the number of purchase orders written does not warrant the use of a special machine for the purpose. If there is any advantage in the use of machines to write purchase orders, it is absolutely necessary that this machine can be used for payroll work, and all the other jobs in general accounting, before it can be recommended for use in the smaller system. Having a machine which will answer these demands, it might be recommended for use in the smallest system. If the volume of business grows too large for one machine, two can be secured. In the same manner as the volume of business increases with the size of city or type of organization, additional machines can be secured. This would permit almost ideal flexibility.

Practically all kinds of accounting equipment and machines have been found in use in one or another school system. However, in no one system at the present time is one machine used for all the jobs of the business department offices, as these jobs are listed on page 49. In a number of cases this is due to the lack of proper application of the machine, but in most cases, even though this were attempted, it would be found impossible because of the limitations of the machines.

It would not be impossible to draw up suggested forms for each accounting machine to the extent to which the machines can be applied. However, since there is only one machine being built and sold which can do all the jobs of general accounting, the forms suggested here are for this one machine, the Burroughs Moon-Hopkins Bookkeeping Machine.

This machine can be used for all the work of accounting. In the small school system employing one administrator and one clerk, it can be used to advantage. The cost will not be prohibitive, since it can be used as a typewriter, adding machine, and calculating machine. The cost of the last three pieces of equipment needed in any business office together nearly equals the cost of the bookkeeping machine which can be used for so many more tasks. As soon as the volume of business increases so that the bookkeeping machine cannot serve to do all the tasks, the typewriter, and then the adding and calculating machines can be procured. As the volume of purely bookkeeping tasks increases, additional bookkeeping machines can be used.

It seems entirely safe to say that a city must be over 100,000 population before the volume of business in any one of the subdivisions of the general accounting tasks warrants the use of a separate machine devoted to it. This statement is based on the following facts: two cities with a population between 5,000 and 10,000 use a bookkeeping machine about three days a month; one city of 70,000 uses a bookkeeping machine for cost recording and payroll purposes two weeks each month; the city with a population of about 150,000 uses a bookkeeping machine for recording orders and payments, and uses the machine only two weeks each month; one city of 200,000 population finds it necessary to use one machine continuously for order writing, and another machine for recording costs in no great detail; in practice no city of all those studied with a population of less than 200,000 used one machine full time for one job.

The Addressograph, however, may be considered an exception to the statement in the above paragraph. It can be used advantageously for a variety of purposes. Some of these in the business office are placing the names on the checks and on the payrolls, and heading the accounts. It can be applied also in addressing envelopes used for sending out report cards and other regular correspondence with parents, and placing the names on pupil report cards, record cards, etc.

This study does not attempt to make favorable or unfavorable comparisons between the various types and makes of bookkeeping machines. Fortunately, this has been easily avoided, since there is no other machine which can do all the required tasks. To show on what facts this last statement is based and to show the unique characteristics of this machine as a general accounting machine the following list is presented. Characteristics which make this machine the only one which can do all the tasks of general accounting:

1. Calculates discounts, retirement deductions, and any other operation involving the use of rates or percentages.
2. Makes extensions on purchase orders requisitions, and time slips.

Other characteristics of this bookkeeping machine which are unique and add to its desirability for school accounting:

1. The machine handles fractions in multiplication in either multiplier or multiplicand.
2. The long underscore line above totals is printed by a single depression of the underscore key.
3. Extensions and other calculations are made by direct multiplication and not by repeated addition.
4. The totals of any calculations are automatically accumulated and printed by the depression of a single key.
5. Not all the figures entering into calculation processes have to be entered on the record in question.
6. Results of calculation do not have to be copied from registers.
7. Automatic alignment of dollars under dollars and cents under cents. No decimal tabulating keys to select and depress.
8. Automatic tabulation between columns.
9. Automatic punctuation.

10. Direct subtraction.
11. Operating errors may be corrected before printing or adding.

These advantages are made clearer in their application in the accounting work as shown in the forms and description which follow. Needless to say, it is quite essential to group all the accounting activities in a central office. If this is not done, duplication of work and the impossibility of the maximum use of any one machine will result.

PURCHASE ORDERS

The form for writing purchase orders is drawn in the usual manner. As many copies as are desired by the type of organization can be made. Three copies, at least, are needed: one copy for the vendor; one for the central business office; and one for the storekeeper, school, or other place of delivery.

Posting Media. The purchase requisition which forms the authority for this order is not presented here since it is not written in the central office. The form for the purchase requisition may be the same form as the stores requisition. There is a difference in their accounting use, however. The stores requisition forms the basis for posting material distributed from stores to the respective accounts. The purchase order rather than the purchase requisition supplies the information which is posted to the accounts to encumber the appropriation for direct purchases. For this reason the items on the business office copy of the purchase order should be coded. Purchase orders for material to be used on jobs should be coded by job number since these amounts are posted to job cost cards.

In order to provide a medium for posting the correction of the entry for the amount of the purchase order, after the invoice has been received, the following procedure is recommended: the invoice is compared with the corresponding copy of the order, which is found in the open order file. The figures representing the amounts which the items on the invoice are over or under the amounts of the items on the order are entered after the respective items of the order. New postings are made to the ledgers from the corrected order, and the order is then filed in the closed order file. In this manner the order becomes the original document for reference for all purposes.

It is entirely possible to use the requisitions instead of the order for making the correction entries. In fact, they should be used when the ledger accounts are encumbered by the amounts on the requisitions instead of the amounts on the orders.

Mechanical Features. The mechanical computing features here need little explanation. The quantity or price may be in fractions or decimals. The price may be either in dollars or cents. The machine automatically aligns dollars under dollars and cents under cents. If there are any deductions or additions for freight or delivery charges they can be computed and added on the machine and their nature stated under description. The amounts are all calculated by direct multiplication and printed with the depression of one key. The total of the bill is automatically accumulated and printed with the depression of a single key.

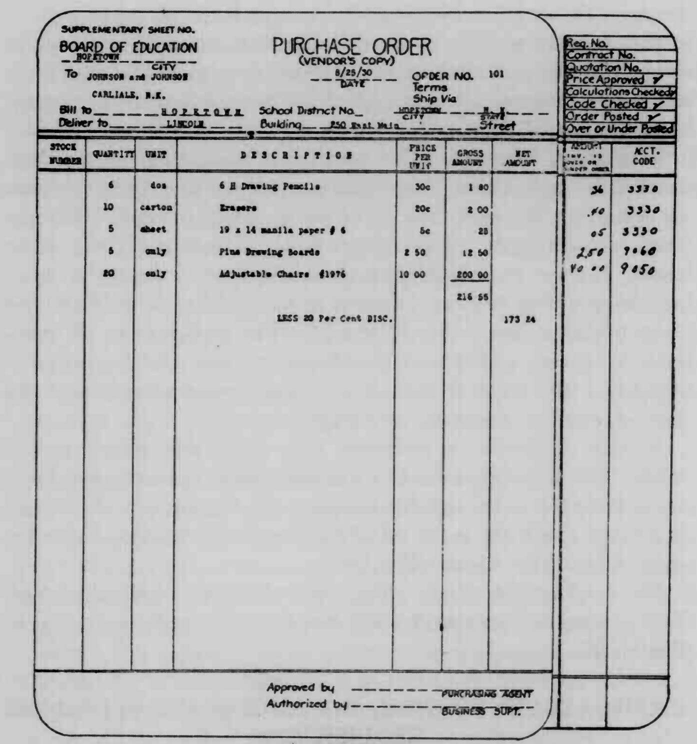
Exhibit 31 shows the purchase order form with sample entries made. The last copy is wider to make possible its use as a medium for posting the order and the correction for the amount the invoice is over or under the order. The heading of the last copy also has space allotted for varied office uses.

The total amount of the order is posted on the vendor's account. This posting is shown as the first entry on the vendor's account in Exhibit 37.

STORES LEDGER POSTING, AND PRICING AND EXTENDING REQUISITIONS

Method of Requisitioning. The stores requisition form here recommended is drawn up for requesting materials by article. The chief advantage of this method is that all requisitions for the same article can be grouped and the stores ledger card for that article need only be inserted once for the posting of all the requisitions of that article. This is the best method for rapid posting of stores records. It cuts to a minimum that job, which is the chief disadvantage of stores record keeping.

It is entirely possible to draw up a requisition form which will enable the requisitioning of more than one article on one form.



SUPPLEMENTARY SHEET NO.

BOARD OF EDUCATION

HOPETOWN CITY

To JOHNSON and JOHNSON

CARLIALE, N.K.

PURCHASE ORDER

(VENDOR'S COPY)

8/25/30 DATE

ORDER NO. 101

Terms

Ship Via

Bill to HOPETOWN School District No. HOPETOWN CITY N. K. STATE

Deliver to LINCOLN Building 250 East Main Street

Req. No.

Contract No.

Quotation No.

Price Approved ✓

Calculations Checked

Code Checked ✓

Order Posted ✓

Over or Under Posted

STOCK NUMBER	QUANTITY	UNIT	DESCRIPTION	PRICE PER UNIT	GROSS AMOUNT	NET AMOUNT	AMOUNT [illegible]	ACCT. CODE
	6	doz	6 H Drawing Pencils	30c	1 80		.36	3330
	10	carton	Erasers	20c	2 00		.40	3330
	5	sheet	19 x 14 manila paper # 6	5c	25		.05	3330
	5	only	Pine Drawing Boards	2 50	12 50		2.50	9060
	20	only	Adjustable Chairs #1976	10 00	200 00		40.00	9050
					216 55			
			LESS 20 Per Cent DISC.			173 24		

Approved by ________ PURCHASING AGENT

Authorized by ________ BUSINESS SUPT.

EXHIBIT 31

First and Last Copy of Purchase Order

However, when such requisitions are extended, a separate stores ledger card must be inserted in the machine for each item on the repuisition. This increase of work is in part balanced by the fact that less requisitions need be inserted in the machine. It does not compensate for the increased time required to pick out of the file and replace the same stores ledger cards repeatedly. If the same articles are seldom requisitioned more than once in one day, it is decidedly advantageous to requisition more than one item on one form. If the reverse is true, as is the case in school supply requisitioning, time is saved for the stores clerks in requisitioning by article.

Writing the Requisition. Information must be sent to the teachers, principals, and others who may requisition, concerning requisitioning procedure. The requisition form must be filled out completely. The space in the upper right-hand corner is primarily for accounting purposes. The subject or type of supply is necessary to enable coding. It may be found advisable and a saving of time to have the teachers code their own requisitions, since one teacher would seldom requisition material over a range of more than ten or twenty code numbers. This coding would have to be checked, however, in the central office. The space allotted to indicate whether the requisition is for supplies from stores or direct purchase is for convenience in routing the requisition once it reaches the central office. Furthermore, it designates the stores requisitions, which must be posted to the cost accounts while the purchase requisitions need not necessarily be posted, depending on the purchasing procedure. The other spaces reserved for the business office are for reference and for providing assurance that the requisition has been properly routed.

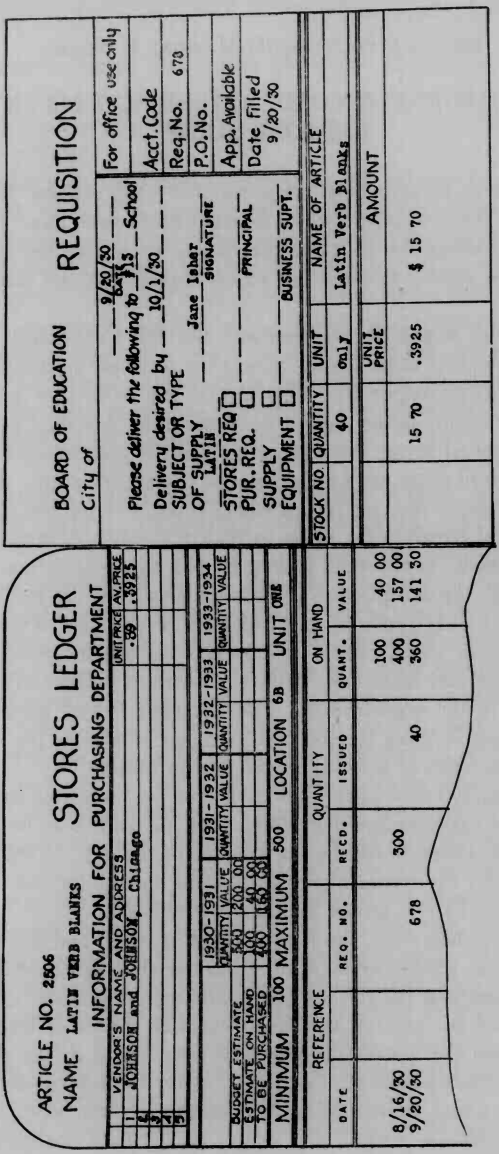
Purchase Record on Stores Ledger Card. The stores ledger card is drawn up so that it may be used both as a record of stock and as a record for the purchasing department. It provides a record of price and vendor as well as a control of the amount to be purchased in accordance with the budget request. It takes the place of the article card which is kept in good purchasing departments, showing the same information. If the arrangement of the offices or the desire of the administration makes it necessary to separate the stock record and the control of purchase record, it can easily be done. It will necessitate, however, a partial duplication of work, increased cost, and increased filing equipment.

When the budget is being made, the budget estimate of the needs for the ensuing year is entered on the stores ledger card after "Budget Estimate." This amount is the same as that which appears in the formal budget. The estimate of the amount of each article on hand at the end of the year is entered on the stores card and subtracted from the budget estimate of the need, giving the amount of that article which needs to be purchased during the next year. The total of all the estimates on hand is subtracted from the total of the budget estimate of need to obtain the amount of the money request for supplies for the next year. Following this procedure, the budget shows the estimate of the actual cost of conducting the schools by schools, type, function, and other classification which may be desired. The total of the budget represents the estimated cost of the school program. To obtain the budget request for funds the cash on hand, the estimate of supplies on hand, and other usable assets are subtracted from the budget total.

This procedure makes it possible to transfer the budget items directly to the cost accounts to provide means of control of expenditure and cost. The stores ledger cards provide the control of the purchase of stores. Supplies which are not placed in stores, or incidental supplies, are controlled by the respective incidental supplies accounts of the various schools or departments.

Mechanics of Posting. Both the stores ledger card and the requisition are inserted in the machine at the same time but are not superimposed. The quantity is posted to the ledger and the new balance on quantity and value is extended. In the same operation the requisition is extended. The difference between the old value balance on hand and the new value balance on hand is printed on the requisition for proof purposes and proves against the extension of the quantity on the requisition, multiplied by the price on the ledger sheet.

Exhibit 32 is presented to show the method of posting the stores ledger card and extending the requisition. The stores ledger card also shows the amount of the article which is to be purchased during the current year. By glancing at the amount to be purchased and the amount received to date, the amount purchasable can be determined at any time. This does not take into consideration goods on order, but this can be determined by referring to the file of live orders. It is possible to show on the stores ledger cards the goods on order not yet received, but since purchases are usually made in large quantities and are usually made infrequently, the need for this reference is very slight. The additional labor of posting all goods ordered on the stores ledger card is properly avoided, for it would supply information of little value, which can be obtained when needed more cheaply by referring to the live order file.



ARTICLE NO. 2506
NAME LATIN VERB BLANKS
STORES LEDGER
INFORMATION FOR PURCHASING DEPARTMENT

	VENDOR'S NAME AND ADDRESS	UNIT PRICE	AV. PRICE
1	JOHNSON and JOHNSON, Chicago	.39	.3925
2			
3			
4			
5			

	1930-1931		1931-1932		1932-1933		1933-1934	
	QUANTITY	VALUE	QUANTITY	VALUE	QUANTITY	VALUE	QUANTITY	VALUE
BUDGET ESTIMATE	500	200 00						
ESTIMATE ON HAND	100	40 00						
TO BE PURCHASED	400	160 00						

MINIMUM 100 MAXIMUM 500 LOCATION 6B UNIT ONE

REFERENCE			QUANTITY		ON HAND	
DATE		REQ. NO.	RECD.	ISSUED	QUANT.	VALUE
					100	40 00
8/16/30			300		400	157 00
9/20/30		678		40	360	141 30

BOARD OF EDUCATION
City of
REQUISITION

9/20/30
DATE
Please deliver the following to #13 School
Delivery desired by 10/1/30
SUBJECT OR TYPE
OF SUPPLY
LATIN
Jane Isher
SIGNATURE
STORES REQ ☐
PUR. REQ. ☐
PRINCIPAL
SUPPLY ☐
EQUIPMENT ☐
BUSINESS SUPT.

For office use only
Acct. Code
Req. No. 678
P.O. No.
App. Available
Date Filled
9/20/30

STOCK NO.	QUANTITY	UNIT	NAME OF ARTICLE
	40	only	Latin Verb Blanks
		UNIT PRICE	AMOUNT
	15 70	.3925	$ 15 70

Exhibit 32

Stores Ledger and Requisition Forms

LABOR EARNINGS RECORD—EXTENDING TIME TICKETS JOB COST CARDS

The system recommended requires that each laborer fill out a time ticket for each job on which he has worked each day. The procedure in posting the earnings record and extending the time slip is somewhat similar to extending stores requisitions and posting the ledger.

Use of the Repair Requisition and the Job Cost Card. All requests for repairs should come through a principal's office or from the maintenance inspectors. This request can be written in quadruplicate. One copy is the request or requisition. A second copy with proper approval forms the work order for the maintenance department. A third copy can be used as the inspector's copy. A fourth copy can become the cost record which is posted from the time slips and material requisitions, being in reality a job cost card and can be filed as such. If the work is done by bid, the same forms still can be used with the exception of the second copy. In case the job is to be done on a work order or open order the reverse side of the second copy, the work order, can be used to give the specific directions regarding work and materials. Additional carbon copies can be made as needed in the organization. The last copy, which should be of heavier paper forming the job cost card, serves also as the copy for the business office of work approved and in process.

The estimated cost of the job is entered on the forms by the officers of the maintenance department. If the work is to be done by contract the estimate will be the amount of the bid. If the work is to be done by the school repair force or an open order, the estimate will be made by the proper maintenance officials.

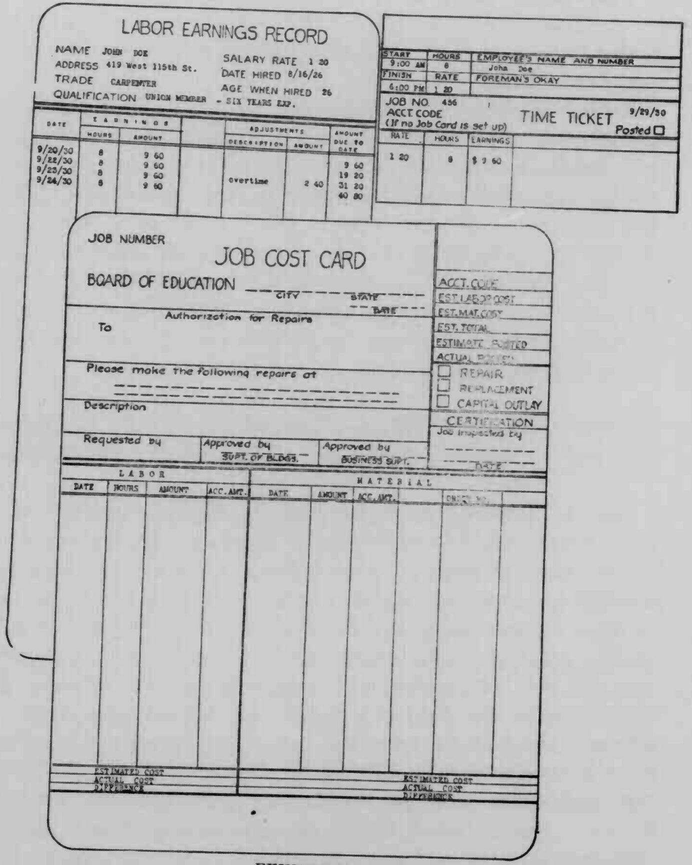
The last carbon copy, the job cost card, is coded and the estimate posted to the proper account to encumber the appropriation. All entries concerning the job are now made on the job cost card. On it are posted the total of the time tickets or the time tickets individually, and the material requisitions from stores or the purchase orders for direct purchase of material. After the job has been completed the actual amount is entered on the job cost card, and the amount which the actual is in excess or less than the estimate is posted to the proper account. The job cost card is then filed in the completed job file.

Exhibit 33 shows the labor earnings record, the time ticket, and the job cost card. The job cost card is the fourth copy of the repair requisition. It is 8¼ inches wide and 10½ inches deep, while the heading, which is only 4 inches deep, is a carbon copy of the repair requisition. The pad is made with three copies 4 inches deep. serving as the repair requisition, job order, and inspector's copy; and the fourth copy 10½ inches deep serves as the job cost card. When the repair requisition reaches the office, the job cost card is placed in the work in process file without any additional labor necessary to heading up the form.

PROFESSIONAL PAYROLL—TEACHERS WAGE RECORD—CHECK WITH MONTHLY STATEMENT ATTACHED

Absence Information on the Payroll. The payroll form is set up so that all the information needed in computing the net amount of the check is shown. Good business procedure demands that teachers be allowed each year a certain minimum number of days of legal absence with pay. Some systems permit the accumulation over a period of years of such leave to be used at one time during one year with the permission of the superintendent of schools. This form provides for the entry of excused absences presumably for illness or death in the immediate family and the accumulated total of such absences to date. The payroll clerk can thus tell whether the teacher has used his or her allotment. Usually it is necessary to refer to a separate record to find the accumulated absence information and check the entire payroll with it. In this case the teacher's record card is placed in the machine over the payroll. The accumulated absences to date last month can be easily read from the last entry while inserting the form. The space allotted to unexcused absences accounts for the absences for which deductions are to be made. All this absence information must be secured from the principal's monthly report of attendance.

Retirement Deductions. Usually the retirement deduction is based on the monthly salary and is, therefore, the same every month.



LABOR EARNINGS RECORD

NAME JOHN DOE
ADDRESS 419 West 115th St.
TRADE CARPENTER
QUALIFICATION UNION MEMBER - SIX YEARS EXP.
SALARY RATE 1 20
DATE HIRED 8/16/26
AGE WHEN HIRED 26

DATE	EARNINGS			ADJUSTMENTS		AMOUNT DUE TO DATE
	HOURS	AMOUNT		DESCRIPTION	AMOUNT	
9/20/30	8	9 60				9 60
9/22/30	8	9 60				19 20
9/23/30	8	9 60				31 20
9/24/30	8	9 60		overtime	2 40	40 80

START	HOURS	EMPLOYEE'S NAME AND NUMBER
9:00 AM	8	John Doe
FINISH	RATE	FOREMAN'S OKAY
6:00 PM	1 20	

JOB NO. 456
ACCT. CODE
(If no Job Card is set up)
TIME TICKET 9/29/30
Posted ☐

RATE	HOURS	EARNINGS	
1 20	8	$ 9 60	

JOB NUMBER
JOB COST CARD
BOARD OF EDUCATION ____ CITY ____ STATE ____
____ DATE ____
Authorization for Repairs
To
Please make the following repairs at
____
____
Description
Requested by
Approved by ____ SUPT. OF BLDGS.
Approved by ____ BUSINESS SUPT.

ACCT. CODE
EST. LABOR COST
EST. MAT. COST
EST. TOTAL
ESTIMATE POSTED
ACTUAL POSTED
☐ REPAIR
☐ REPLACEMENT
☐ CAPITAL OUTLAY
CERTIFICATION
Job inspected by
____
________ DATE

LABOR				MATERIAL					
DATE	HOURS	AMOUNT	ACC. AMT.	DATE	AMOUNT	ACC. AMT.		ORDER NO.	
	ESTIMATED COST							ESTIMATED COST	
	ACTUAL COST							ACTUAL COST	
	DIFFERENCE							DIFFERENCE	

EXHIBIT 33
Labor Earnings Record, Time Ticket, and Job Cost Card Forms

In such cases the rate need not be entered every month, but only the amount, which is mechanically subtracted from the monthly salary. In those cities where the retirement deduction is based on the net amount paid, a slight revision of the form will be necessary to subtract the absence deduction before computing the retirement deduction.

Writing the Names on the Payroll and Pay Checks. The name of the payee and the amount of the check in figures are written on the same line. The amount can be written in letters on a check protecting machine or by means of the bookkeeping machine.

A procedure which would be desirable, and which is only a slight change from many in use, calls for the addressographing of the names on the payroll and pay checks. The payroll with names written thereon can be sent out to the respective schools for the entry of the absences to be made in the first and third columns of the payroll. This system is especially desirable when the number of names on the payroll is more than 500.

Posting Salaries. At some time or other the amount of the payroll must be entered in the books of account. This may be done by the use of tabulating cards or by entry by hand by totals or by whatever divisions are desired. While a method and forms are recommended for recording all costs by three analyses in one operation (the unit account for each school, total for each school, and total of the unit account for all schools) it is necessary to consider teachers', clerical, janitorial, and overhead professional salaries separately from other costs. It would be possible to post the salaries on the three forms as all other costs are posted. If this were done, it would require additional work.

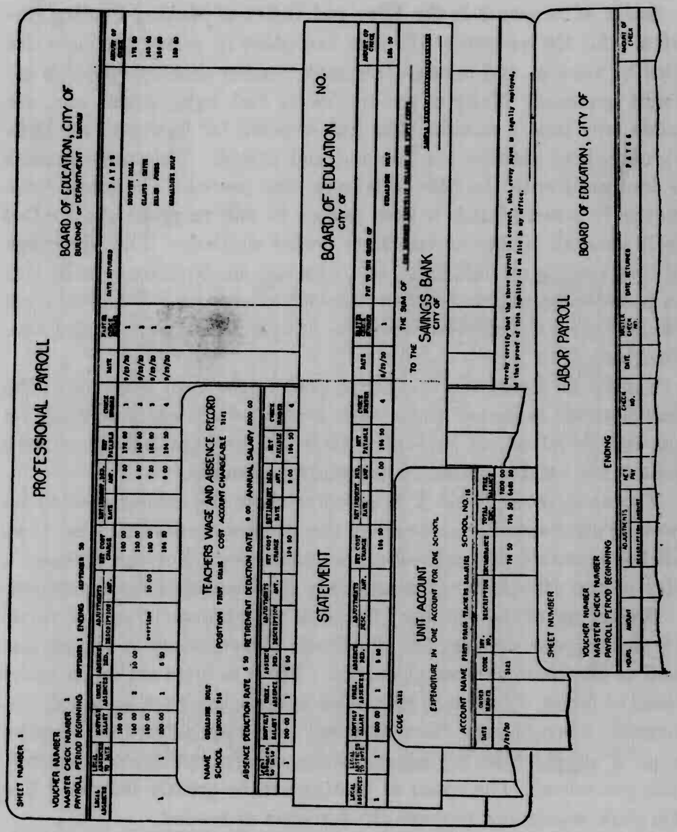
The most efficient method of entering salaries on the accounts is to enter them directly from the automatic accumulations secured while making the payroll. If salary accounts are set up in accordance with the division of accounts given in Appendix A, the names of the building payrolls should be arranged according to grade or subject rather than alphabetically. Taking the payroll of an elementary school for example, after the pay checks for the first grade teachers are written, the total is posted to the first grade salary account of that school. The second grade teachers' checks are then written and the second grade salary account placed in the machine and posted, etc. The salary accounts can be inserted and posted without disturbing the payroll form. This method of posting has the advantage that the figures are already in the machine. The card need only be inserted and the information entered by depressing one key, and when the payroll is finished, the posting is also completed with little additional time and effort. If desired, after the payroll for the school has been completed, the school account giving the total cost of the school can be inserted and the total of the payroll entered.

This method will not give currently the amount of all first grade teachers' salaries for the city. It supplies this and similar information only by school. The accounts serve, however, as a control of the budget, which is the most important current function of school accounts. For the cost analysis at the end of the year an adding process will give the totals by accounts for the entire city. It is well to note that the totals of accounts for the entire city other than salaries are given currently.

Exhibit 34 shows the manner of writing the payroll, the teacher's wage and absence record, the check with statement attached, and manner of posting the accumulated total to the cost account. The payroll form is placed on the round platen of the machine and is not disturbed until completed. It moves up automatically one space after each entry. The insertion of the wage and absence record card and the check does not disturb the payroll form. After the checks for the teachers of a certain type, such as first grade teachers, have been written, without disturbing or affecting the payroll the unit card is inserted without carbon paper, aligned under the net cost charge column and the accumulated total printed on it. The payroll form is so constructed that the retirement deduction is made to secure the amount of the check, but it is included to secure the amount of the posting to the cost account.

LABOR PAYROLL AND PAY CHECKS

The labor payroll is made up from the earnings record cards. The process is somewhat simpler than that of the professional payroll. Less information is needed. The amount of the labor payroll is not entered on the cost records, since this amount has already been entered or is to be entered when the job costs are entered. The labor payroll form is shown on Exhibit 34.



PROFESSIONAL PAYROLL

BOARD OF EDUCATION, CITY OF

TEACHERS WAGE AND ABSENCE RECORD

STATEMENT

BOARD OF EDUCATION
CITY OF

NO.

TO THE SAVINGS BANK
CITY OF

UNIT ACCOUNT

LABOR PAYROLL

BOARD OF EDUCATION, CITY OF

SHEET NUMBER

EXHIBIT 34

Professional Payroll, Teachers Wage and Absence Record, Pay Check, Unit Cost Account, and Labor Payroll Forms

COST AND APPROPRIATION CONTROL ACCOUNTS

The cost records are kept currently by account, by total for each school for all accounts, and by total for each account for the entire city. The forms on Exhibit 36 are inserted in the machine at one time. The unit account is posted and a carbon copy of the entry made on the individual school account.

Order of Accounts in the Files and Order of Making Posting Entries. All the accounts with the exception of salary accounts are filed by account and in school sequence, rather than by school in account sequence. Many of the entries for fuel, light, power, etc., are made only once a month. The unit account for light and the individual school account are inserted and posted. This same process is continued until the light bills have been posted. The total, automatically accumulated, is then posted in one entry on the control light account. Other accounts are posted similarly. The advantage of thus posting all fuel, light, etc., accounts in sequence is to be able to post the automatic total to the control account. This could not be done if all the different accounts of each school were posted consecutively.

Exhibit 35 shows the manner of posting the light accounts . The unit account is posted and a carbon copy of the entry is made on the individual school account. After all the light bills have been posted, the total is posted on the control accounts.

The analysis in Table X is given to show the saving effected by posting all the similar accounts of the city consecutively rather than all the accounts for each school consecutively. For the example a city of 100 schools is taken and only four accounts are considered.

Regardless of the number of schools the number of entries saved by posting one account for all schools consecutively is almost one half of the total number of entries. There is little saving in insertions of forms. The same principles apply when posting supply accounts. Even though there may not be a requisition for the same type of supply from all schools, there will be sufficient to warrant this procedure. The speed of posting can be greatly increased if a file clerk selects and replaces the accounts as needed.

The Individual School Account. Some explanation of the individual school account is necessary. On it is posted every entry which is entered on the unit accounts. It does not show the total expenditure for the school without adding up the items. This account is more in the form of a statement to each school principal and department head showing the condition of his account and the transactions for the month. It is true that some accounts may have several entries scattered over the sheet, but the last entry of any ac-

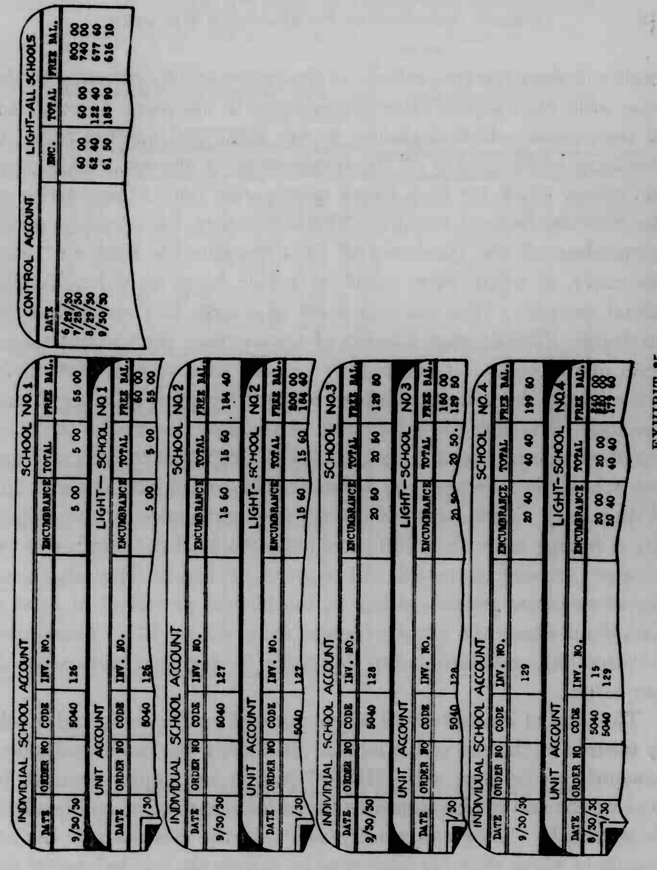


EXHIBIT 35
An Example of the Manner of Posting Light Accounts

TABLE X

SAVING OF INSERTION OF ACCOUNT CARDS AND SAVING OF POSTING ENTRIES BY POSTING ONE ACCOUNT FOR ALL SCHOOLS CONSECUTIVELY

	Posting All Accts. for One School		Posting One Acct. for All Schols	
	Insertions	Entries	Insertions	Entries
Indiv. School Accounts	100	(400)*	400	(400)*
Unit Accounts	400	400	400	400
Control Accounts	400	400	4	4
Totals	900	800	804	404

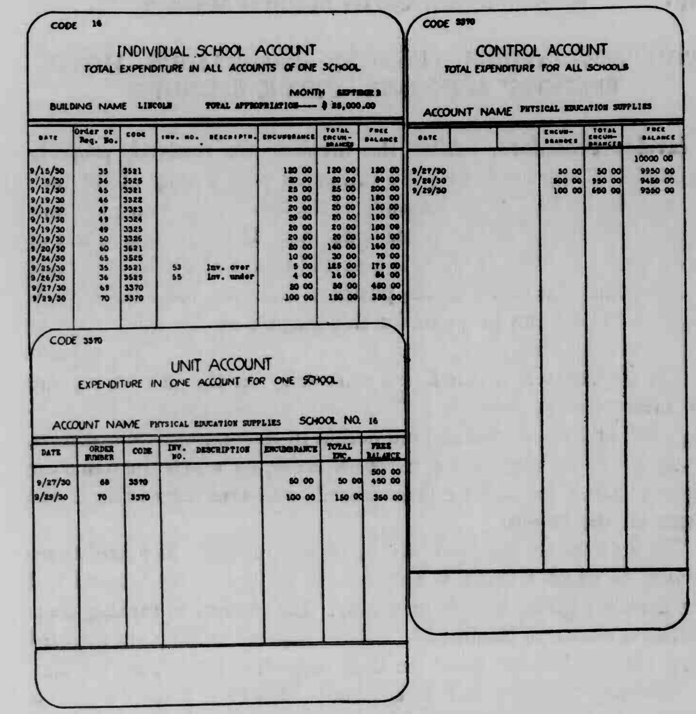
* These entries are always carbon copies of the entries on the unit accounts and cannot be counted as extra work. The extra work is accounted for in increased number of insertions with carbons.

count will show the free balance of that account. By referring to the same code number, the other transactions in the same account can be ascertained. At first glance, it may seem that another report is necessary which groups all the transactions of the same account of one school which are thus found interspersed with other entries on the individual school account. This last report, for example, would accumulate all the purchases of "Art Supplies for School I" into one entry, of which there might be a half dozen on the individual school account. This has been tried in a large city and found unprofitable. The average number of transactions per account ranges from one to eight. It can readily be seen that with so few entries per account, the individual school account is almost a listing of unit accounts. The finer the subdivision of accounts the smaller the number of entries per account. In one city having twenty-seven accounts per school the average was seven entries per month per account. With a finer classification of accounts recommended in the Appendix A having more than 100 accounts per school the number of entries per account per month will be greatly reduced. This large number of accounts per school has an established precedent at least in Cleveland where the number ranges from 50 to 125. There may be other cities not included in this study having even more accounts per school.

The total of the individual school account can be easily and quickly secured at the end of the month. If desired, the individual school account can be kept with "Ditto" carbon and copies made to be sent at the end of the month to the building principal and heads of departments. They can readily ascertain the condition of the accounts in which they are interested by taking the free balance of the last account entry. By keeping these reports on file they can refer to previous reports to ascertain the condition of accounts which were not active during the current month.

Exhibit 36 shows the individual school account after a number of entries have been made and in addition shows the effect on the individual school and control account of one entry on the unit account.

Order of Posting Salary Accounts. Salary accounts do not fit in with the procedure of posting applied to other accounts. It is not practical to post all first grade teachers' salaries, then all second,



CODE 16

INDIVIDUAL SCHOOL ACCOUNT

TOTAL EXPENDITURE IN ALL ACCOUNTS OF ONE SCHOOL

MONTH SEPTEMBER

BUILDING NAME LINCOLN TOTAL APPROPRIATION---- $ 25,000.00

DATE	Order or Req. No.	CODE	INV. NO.	DESCRIPTN.	ENCUMBRANCE	TOTAL ENCUMBRANCES	FREE BALANCE
9/15/30	35	3521			120 00	120 00	180 00
9/18/30	36	3525			20 00	20 00	80 00
9/12/30	45	3321			25 00	25 00	200 00
9/19/30	46	3322			20 00	20 00	180 00
9/19/30	47	3323			20 00	20 00	160 00
9/19/30	49	3324			20 00	20 00	180 00
9/19/30	49	3325			20 00	20 00	180 00
9/19/30	50	3326			20 00	20 00	160 00
9/20/30	60	3621			20 00	140 00	160 00
9/24/30	65	3525			10 00	30 00	70 00
9/25/30	35	3521	53	Inv. over	5 00	125 00	175 00
9/26/30	36	3529	55	Inv. under	4 00	16 00	84 00
9/27/30	69	3370			50 00	50 00	460 00
9/29/30	70	3370			100 00	150 00	380 00

CODE 3370

CONTROL ACCOUNT

TOTAL EXPENDITURE FOR ALL SCHOOLS

ACCOUNT NAME PHYSICAL EDUCATION SUPPLIES

DATE			ENCUMBRANCES	TOTAL ENCUMBRANCES	FREE BALANCE
					10000 00
9/27/30			50 00	50 00	9950 00
9/28/30			500 00	550 00	9450 00
9/29/30			100 00	650 00	9350 00

CODE 3370

UNIT ACCOUNT

EXPENDITURE IN ONE ACCOUNT FOR ONE SCHOOL

ACCOUNT NAME PHYSICAL EDUCATION SUPPLIES SCHOOL NO. 16

DATE	ORDER NUMBER	CODE	INV. NO.	DESCRIPTION	ENCUMBRANCE	TOTAL ENC.	FREE BALANCE
							500 00
9/27/30	68	3370			50 00	50 00	450 00
9/29/30	70	3370			100 00	150 00	350 00

EXHIBIT 36
Individual School Account, Control Account, and Unit Account with Sample Entries

etc., of the whole city. The checks and the payroll are made by schools. Groupings by type within the schools are feasible, however. Since all the original payroll information comes grouped by schools, it is not very easy to redistribute it by type of activity or account, as it may be with light and fuel bills which are apt to come indivdiually or grouped for the whole system. Furthermore, as has already been pointed out, it is advisable to post the subdivisions of the salary accounts of each school and then the total of these sub-accounts to the individual school account while making the payroll and writing the pay checks.

VOUCHER—INVOICE REGISTER—REMITTANCE ADVICE VENDORS' ACCOUNTS—CHECK REGISTER

Invoice Procedure. After the invoices are received, properly audited and approved, they are compared with a copy of the purchase order on file. If the amounts of the two are the same, the purchase order is filed in the closed order file. If the invoice is less or more than the order, if there is a partial return of goods, or if there is a discount, the items on the purchase order are corrected accordingly in the column provided for this purpose on the office copy of the order. An example of this is shown in Exhibit 37. (The amount of the discounts is accumulated separately on the invoice register for memorandum purposes.) This order is then given to the posting clerk and the corrections are posted to the appropriate accounts. Using the office copy of the purchase order, on which the items are already coded, for making these corrections saves the coding of the items on the invoice

The invoices are registered on the invoice register. The remittance advice, to which a check is attached, is written as the original and the invoice register is made as a copy. The method of making these entries is shown in Exhibit 37. All the invoices as they are received from the vendors are listed on their respective remittance advices.

Vouching Invoices and Remittance Advices. Each invoice is properly audited and vouched for by the proper school administrative officers. The invoices need not be separately approved by school board members. Since the invoices are the original vouchers, the remittance advice is a voucher only to the extent that it must certify that the respective invoices listed thereon are on file properly authorized.

At the end of the month the remittance advices forming secondary vouchers with checks attached can be approved and paid in the manner designated by the administration. The remittance advice accumulating daily the amounts of the invoices saves the peak load at the end of the paying period, if payments are not made as invoices are received.

Check Register as a Means of Securing Board Approval of Payments. The check register is secured as a by-product of the writing of the check. See Exhibit 37. The form provides for the distribution of credits to a limited number of banks and funds. If desired separate accounts with the banks can be set up as general ledger accounts to which the totals of checks drawn on each bank are posted daily.

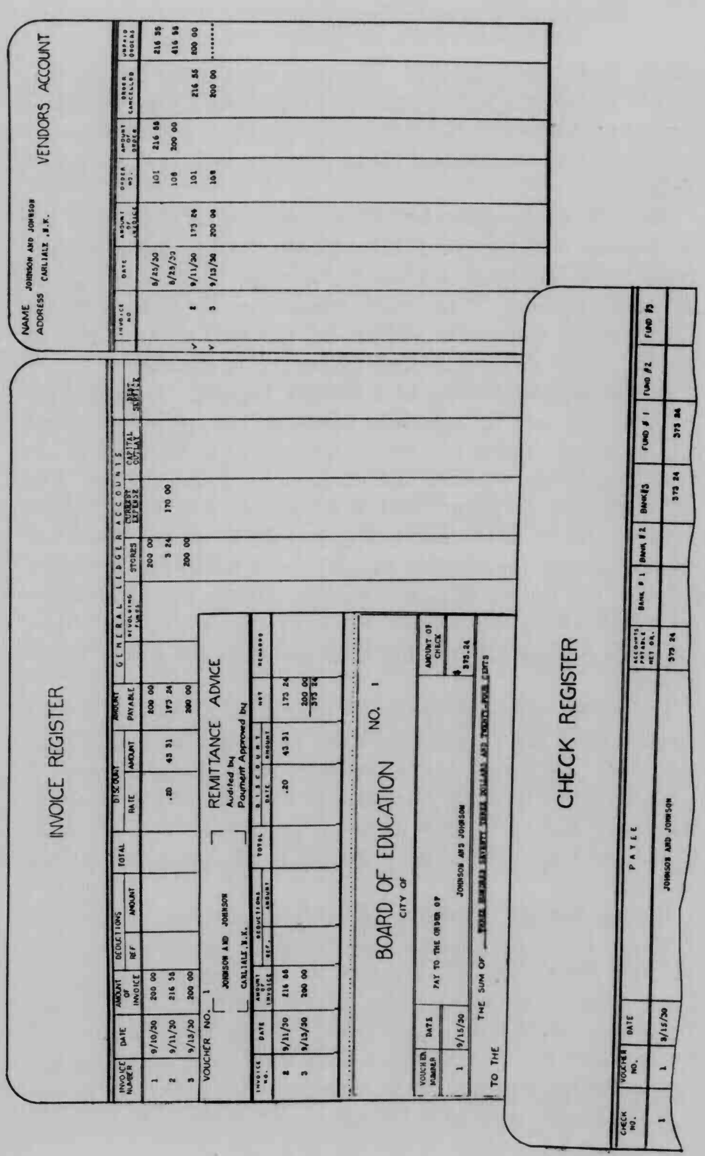
Since the check register lists all payments, copies of it, which can be prepared with the use of Ditto carbon, can be used as a statement to the board and as a means of securing the board's authorization for payment. If the board wishes to see the amount of each invoice rather than, or in addition to, the total payment to each vendor, copies of the remittance advices can be attached.

Invoice Register Serving as a Voucher Register. Since each invoice entered upon the remittance advice has been properly vouched for, the invoice register is a chronological listing of the items on the remittance advice vouchers and serves as a voucher register. For this reason columns are provided for net amount, a credit to accounts payable, and for stores distribution, a credit to stores. These two columns provide the complete monthly credit entries for the general ledger. The further columnar analysis provides for expenditures for capital outlay, debt service, current expense, stores, and revolving funds forming the monthly debit entries to the general ledger accounts.

The payroll expenditures can be entered by means of a journal voucher which can be numbered either as the invoices or in a separate series. Petty cash can be accounted for in similar manner. A journal voucher furnishes the reference document and the accounting distribution. A check is written to petty cash to replace the amount spent and this amount is charged to the appropriate expense accounts.

Posting Vendors' Accounts. As each invoice from a particular vendor is listed, the vendor's account, which has been inserted on the right (See Exhibit 37), is posted for the amount of the invoice; the purchase order number of the order is entered for reference; and the amount of the order is subtracted from the unpaid orders. After the check has been written, a small check mark indicating that the invoice has been paid can be placed after the respective amount.

If the invoice received is for only a part of the order, although


INVOICE REGISTER

VENDORS ACCOUNT

REMITTANCE ADVICE

BOARD OF EDUCATION

CHECK REGISTER

Exhibit 37

Invoice Register, Vendors Account, Remittance Advice, Check, and Check Register with Sample Entries

the rest of the order is to be sent later, the posting of the vendor's account will be more complicated. The amount of the invoice is entered as usual on the vendor's account, and the amount of the order liquidated and subtracted from the unpaid orders in the usual manner. A back order may be prepared and entered to reencumber the account.

Exhibit 38 shows the forms for general ledger, bank, and fund accounts. The headings debit, credit, and balance are used on all forms, making it possible, if desired, to use the same printed form for any account. The descriptive heading of each column is entered in the column as explanation. They might be used as the headings. The manner of posting these accounts is shown in Diagram 1.

The same form can be used to record the total of all revolving fund receipts and expenditures. A subsidiary account using the same form can be used for each individual source of revolving fund receipt or expenditure.

Exhibit 39 shows the insurance, bond, property, and receipt registers.

The insurance register, as its name implies, merely lists the insurance policies. The insurance payments are entered on the cost records on their respective unit accounts as any other cost.

In a small system one receipt account may suffice. It is well, however, to set up a separate account for each source of income.

Exhibit 40 shows the headings of all the different forms in the relative positions in which they are inserted in the machine. If the stops are set for the payroll form, with few exceptions the other forms can be used without changing the stops by merely adjusting the paper guides to enable the insertion of the form in the place in which the columns will be coordinated with the stops already set. By coordinating all the forms in this manner they can be used on on the same machine with a minimum number of "stop" changes.

On each form are given the over all dimensions. At the bottom of the sheet is given the width of each column. No change can be made in any form without considering its effect on all the rest.

The headings on the right-hand side represent the forms which are inserted in that relative place on the platen at the same time that the forms on the same horizontal line on the left are inserted.

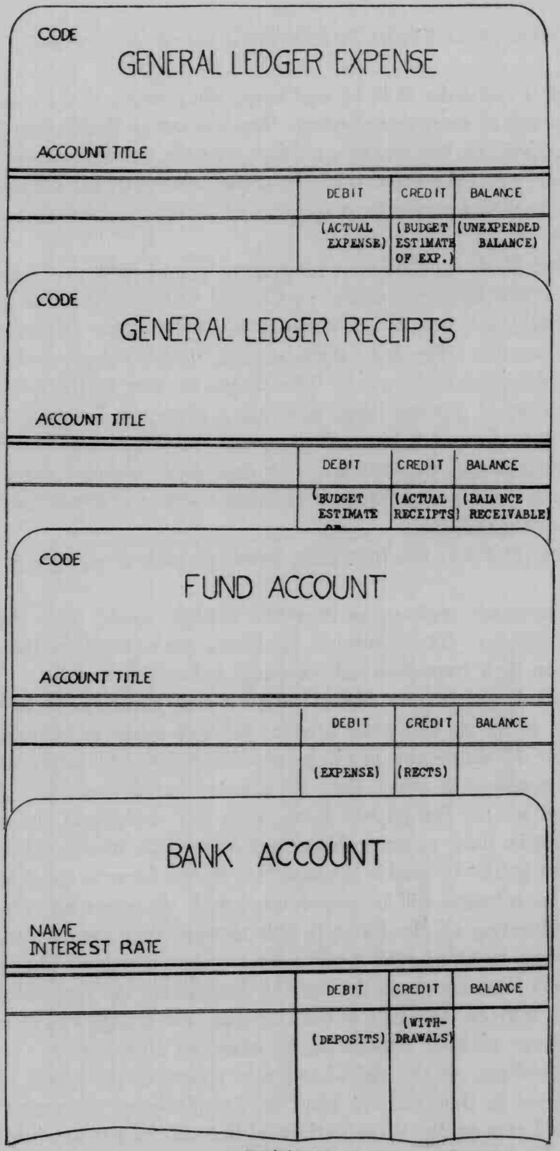

CODE
GENERAL LEDGER EXPENSE
ACCOUNT TITLE
DEBIT
CREDIT
BALANCE
(ACTUAL EXPENSE)
(BUDGET ESTIMATE OF EXP.)
(UNEXPENDED BALANCE)
CODE
GENERAL LEDGER RECEIPTS
ACCOUNT TITLE
DEBIT
CREDIT
BALANCE
(BUDGET ESTIMATE
(ACTUAL RECEIPTS)
(BALANCE RECEIVABLE)
CODE
FUND ACCOUNT
ACCOUNT TITLE
DEBIT
CREDIT
BALANCE
(EXPENSE)
(RECTS)
BANK ACCOUNT
NAME
INTEREST RATE
DEBIT
CREDIT
BALANCE
(DEPOSITS)
(WITH-DRAWALS)

Exhibit 38

General Ledger, Bank, and Fund Account Forms

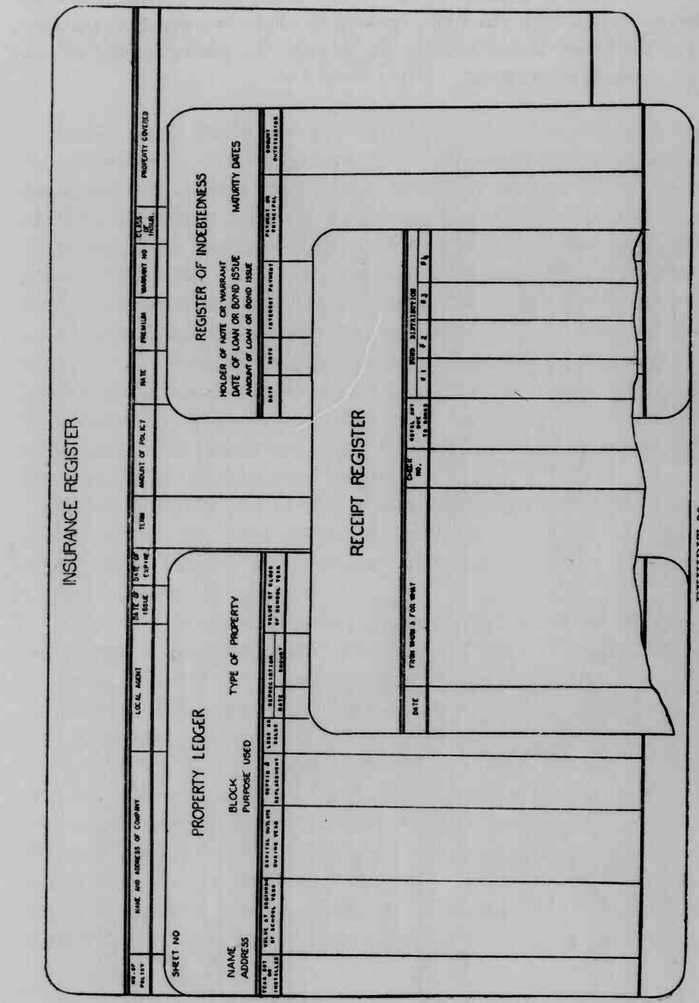

INSURANCE REGISTER
NO. OF POLICY
NAME AND ADDRESS OF COMPANY
LOCAL AGENT
DATE OF ISSUE
DATE OF EXPIRE
TERM
AMOUNT OF POLICY
RATE
PREMIUM
WARRANT NO
CLASS OF INSUR.
PROPERTY COVERED
SHEET NO
PROPERTY LEDGER
NAME
ADDRESS
BLOCK
PURPOSE USED
TYPE OF PROPERTY
YEAR BOT OR INSTALLED
VALUE AT BEGINNING OF SCHOOL YEAR
CAPITAL OUTLAYS DURING YEAR
REPAIR & REPLACEMENT
LOSS OR SALES
DEPRECIATION
DATE
AMOUNT
VALUE AT CLOSE OF SCHOOL YEAR
REGISTER OF INDEBTEDNESS
HOLDER OF NOTE OR WARRANT
DATE OF LOAN OR BOND ISSUE
AMOUNT OF LOAN OR BOND ISSUE
MATURITY DATES
DATE
NOTE
INTEREST PAYMENT
PAYMENT ON PRINCIPAL
AMOUNT OUTSTANDING
RECEIPT REGISTER
DATE
FROM WHOM & FOR WHAT
CHECK NO.
TOTAL AMT DUE TO FUNDS
FUND DISTRIBUTION
#1
#2
#3
#4

EXHIBIT 39

Insurance, Bond, Property, and Receipt Register Forms

To enable the alignment of two forms on the same platen, it is split seven inches from the right, making in effect two separate platens. For the longer forms, such as the payroll, the platen is used as one by a simple adjustment.

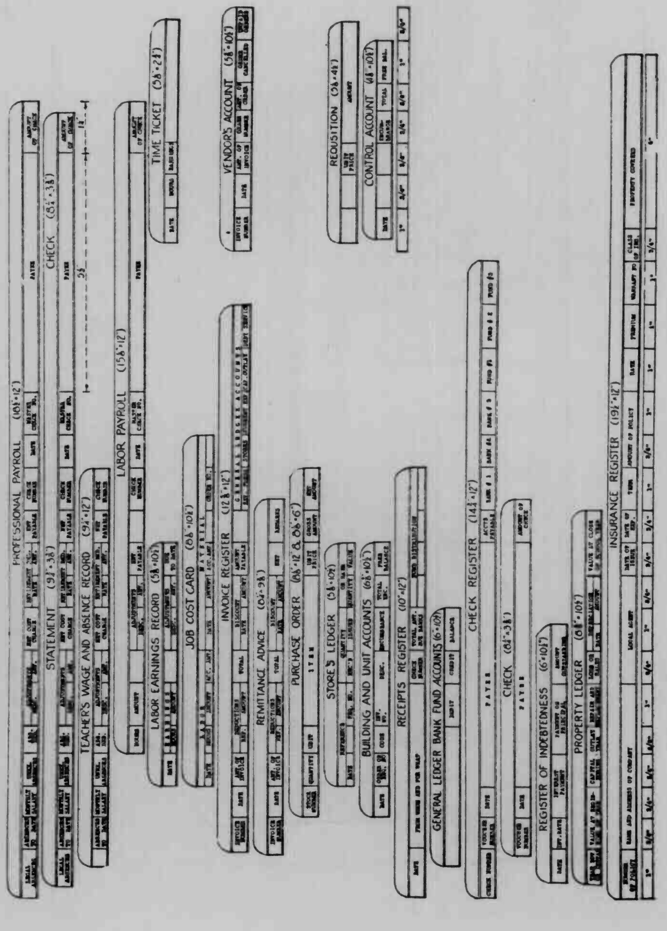

PROFESSIONAL PAYROLL
STATEMENT
TEACHER'S WAGE AND ABSENCE RECORD
CHECK
LABOR PAYROLL
LABOR EARNINGS RECORD
TIME TICKET
JOB COST CARD
VENDORS ACCOUNT
INVOICE REGISTER
REMITTANCE ADVICE
PURCHASE ORDER
STORES LEDGER
REQUISITION
CONTROL ACCOUNT
BUILDING AND UNIT ACCOUNTS
RECEIPTS REGISTER
GENERAL LEDGER BANK FUND ACCOUNTS
CHECK REGISTER
CHECK
REGISTER OF INDEBTEDNESS
PROPERTY LEDGER
INSURANCE REGISTER

EXHIBIT 40

Inventory of Account Headings Showing the Exact Size of the Forms and the Coordination of the Columns

CHAPTER VI

BOOKKEEPING PRINCIPLES APPLIED TO SCHOOL ACCOUNTING

Double Entry Bookkeeping. Nothing has been mentioned thus far about double entry bookkeeping. The general ledger accounts are usually set up on a double entry basis. In Chapter VII of "Accounting Procedure for School Systems," by Engelhardt and von Borgersrode, the source of debits and credits for the general ledger accounts is shown. This does not take into consideration the entries on the subsidiary ledgers, vendors' accounts, and other accounting records. Since the accounts in the general ledger are control accounts of all subsidiary ledgers, it simplifies matters for the administrator untrained in accounting to keep only the control accounts in balance. By reconciling the sum of all the entries to the subsidiary ledgers with the control account, a sufficient check is formed of the accuracy of the subsidiary ledgers.

Sources of Debits and Credits of General Ledger Accounts. Diagram 1 shows the most frequently used general ledger accounts drawn up as ledger "T" accounts* with sample entries and the source of the entries indicated.

To open the books the amount of the budget estimate is entered in the general ledger accounts. The numeral "1" on the left side of the chart indicates the budget estimates of the receipts and the usable assets. The estimates of receipts are entered as debits to the receipt accounts. The stores on hand amount is entered as a debit to stores. The cash on hand is entered as a debit to cash. Since practically all payments of a Board of Education are made by check there is no need of a cash account separate from bank accounts. The cash account and the bank account or accounts can be the general ledger accounts. If there are a large number of bank accounts, one account can be used as a control of all of them so that the amount of cash in the banks can be ascertained by referring to one record.

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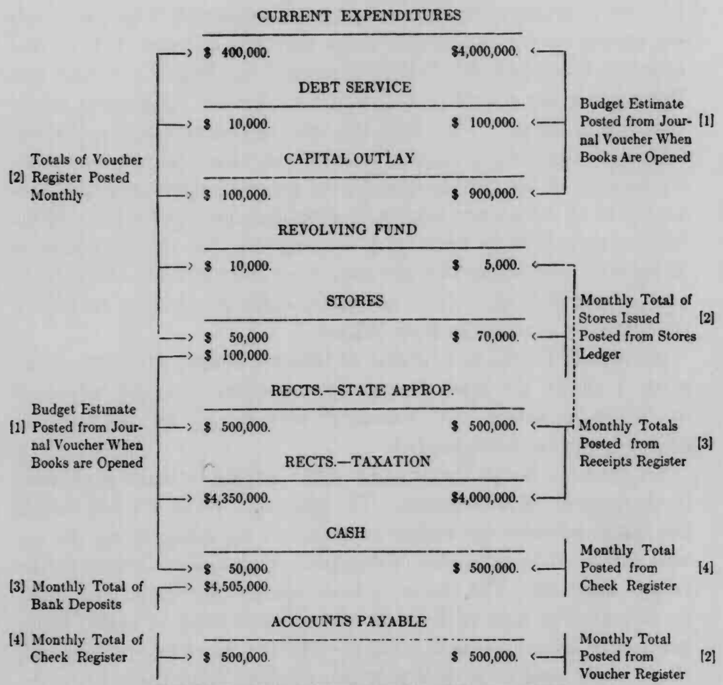
* Ledger "T" accounts are accounts drawn up to show the title of the account and the debit and credit entry without giving the date, descriptive information or reference.

DIAGRAM 1

GENERAL LEDGER ACCOUNTS WITH SAMPLE ENTRIES
WITH THE SOURCE OF THE ENTRY INDICATED


CURRENT EXPENDITURES
$ 400,000.
$4,000,000.
DEBT SERVICE
$ 10,000.
$ 100,000.
CAPITAL OUTLAY
$ 100,000.
$ 900,000.
REVOLVING FUND
$ 10,000.
$ 5,000.
STORES
$ 50,000
$ 100,000
$ 70,000.
RECTS.—STATE APPROP.
$ 500,000.
$ 500,000.
RECTS.—TAXATION
$4,350,000.
$4,000,000.
CASH
$ 50,000
$4,505,000.
$ 500,000.
ACCOUNTS PAYABLE
$ 500,000.
$ 500,000.
[2] Totals of Voucher Register Posted Monthly
[1] Budget Estimate Posted from Journal Voucher When Books are Opened
[3] Monthly Total of Bank Deposits
[4] Monthly Total of Check Register
Budget Estimate Posted from Journal Voucher When Books Are Opened [1]
Monthly Total of Stores Issued Posted from Stores Ledger [2]
Monthly Totals Posted from Receipts Register [3]
Monthly Total Posted from Check Register [4]
Monthly Total Posted from Voucher Register [2]

Note: By referring to a numeral on the left and the same numeral on the right, a debit entry and its equivalent credit entry can be readily seen.

By referring to the numeral "1" on the right side of the chart the entries for the estimate of expenditures can be seen. These entries are credited to the general ledger expense accounts. These entries for the estimate of expenditures must equal the entries for estimated receipts.

Sample entries are made further to show the probable picture of the accounts after the first month's entries. The voucher register shows the expenditures by major division of accounts or control accounts. By referring to the numeral "2" on the left side of the chart the entries for the disbursements can be seen as made from the voucher register to their respective accounts. These entries must be balanced by equivalent credits. The credits can be seen by referring to the numeral "2" on the right side of the chart. As is shown there, the credits are the total of the accounts payable, which is obtained from the voucher register as a total of all vouchers to be paid and the amount of the stores distributed.

The monthly total from the check register furnishes the debit entry for accounts payable and its equivalent credit entry is the same entry made to the bank accounts or the cash account showing the withdrawal of funds. This entry is designated by the numeral "4" on Diagram 1. I is quite possible that not all the bills incurred have been paid during the month, in which case the debit to accounts payable will be less than the credit. This will not affect the equilibrium of the accounts, since the credit entry to the bank accounts will be correspondingly smaller.

The totals of the receipts are credited to the receipt accounts, as shown by referring to the numeral "3," and debited to the bank account in which they are deposited. Since the revolving fund expenditures are made by check and are considered as all other expenditures in the bookkeeping, the revolving fund receipts likewise have to be entered on the accounts. This inflates the total receipts. To ascertain the net income for the year only the net receipts of the revolving fund can be considered as a part of the income.

Prepaid and Deferred Expenses. Prepaid expenses, as well as deferred expenses, can be set up as a general ledger account. These accounts are necessary to absolutely accurate cost accounting. If accurate accounting is desired, every individual account should be closed at the end of the year and the amount of unused supplies, fuel, etc., as well as prepaid insurance, rent, etc., should be transferred to the prepaid expense account in the general ledger as a debit. This account may be subdivided if desired. These balance-on-hand amounts appearing on the various accounts become the first entries for the beginning of the new year. Since they will be included in the total debits at the end of the first month to the general ledger expenditure accounts their total is credited to the general ledger prepaid expense account which balances that account completely. The same procedure is used the following year. In business conducted for a profit a similar procedure is followed monthly.

Needless to say to keep accounts on a completely accurate cost basis begins to complicate accounting. It is seldom, if ever, done in any school system. One very large city school system has at the end of each year one item of nearly five million dollars salary due teachers for absence deductions and does not consider this as an expense, assuming that the previous year the same condition existed and for all practical purposes balanced. This method, while it could not be followed in business, is not to be condemned in public schools. Accurate control is more necessary and important than accurate cost accounting. Especially in the smaller systems, and this applies to larger systems, the cost figures obtained by posting the orders assure figures accurate enough for administrative purposes. Major accounts, such as central stores, should absolutely be included in the general ledger and the balance of stores not counted as an expense. When one considers the immense amount of equipment and books which are bought and paid for in any one year and accounted for as a legitimate cost of that year's program, while the books may be used for three or ten years, the hopelessness of prepaid expense accounts can be seen unless they also include all these items of equipment at the present valuation, charging only depreciation to the last year's cost. Such intensive bookkeeping is probably not done in any school system anywhere owing to the expense involved in keeping the books. The fact that schools are not profit-making institutions permits this seeming laxness. It is defended and defensible by the assumption that practically equal amounts of books and equipment wear out and have to be replaced each year.

Double Entry Bookkeeping for Subsidiary Records. To satisfy the most exacting demands of any accountant and to secure completely the advantages of double entry bookkeeping, all records subsidiary to the general ledger have also been set up on a double entry basis. The forms and system recommended in this chapter have been drawn up with this in mind. Table XI lists all the financial transactions which affect the accounts or records. After each transaction or the document showing the record of this transaction, the debit and credit entries are shown as they affect the accounts or records indicated in the heading of the table. The left half of the table is concerned only with the entries which are posted monthly by totals in the general ledger. The right half shows how the subsidiary records are affected by the double entry. The unit expense account means the finest division of accounts posted. If any sub-controls, such as total of building, or totals of each account for the entire city are also posted, as shown by the forms on Exhibit 36, only one of these entries is considered as the debit entry to expense, the others being memorandum or analysis entries.

(Explanation of Table)

1. When the purchase order for material which is to be distributed directly to the school is written it must be posted in the expense account to encumber the appropriation. At the same time the credit entry is obtained by posting the amount of the order to the vendor's account. For example, if the appropriation for laboratory equipment, Building 1, is $100 and an order for $50 worth of equipment has been issued, the account will show an available balance of $50 spendable for equipment.
2. After the invoice is received, it is checked with the purchase order by item. The amount of the invoice received, let us assume, might be fifty-five dollars. This invoice is credited to the vendor's account, at the same time liquidating or cancelling the order entry. Since the invoice is five dollars more than the estimated amount of the order, five dollars is charged against the account. The account for laboratory equipment for building number one now shows a total incumbrance of fifty-five dollars and a free balance of forty-five dollars. The fifty-five dollars on the vendor's account is balanced by the fifty-

TABLE XI

THE DEBIT AND CREDIT ANALYSIS OF EACH TRANSACTION AFFECTING THE ACCOUNTS

	—GENERAL LEDGER ENTRIES—					—SUBSIDIARY LEDGER ENTRIES—						
		Invoice and Voucher Register										
Transactions or Original Documents	Rects. Reg.	Accts. Pay. and Stores Distributed	Major Disbursement Accounts	Check Register (Debit Accounts Payable)	Bank Accts	Vendor Accts.	Stores Ledger*	Salary Accts.	Labor Wage Accts.	Job Cost Cards	Unit Exp. Accts.†	Rev. Fund Accts.
1. P. O. Mat. for Dir. Dist.						CR					DR	
2. Invoice		CR	DR			CR					DR	
3. Check				DR	CR							
4. Purchase Order—Stores						CR	DR					
5. Invoice		CR	DR			CR	DR					
6. Check				DR	CR							
7. Est. of Repair Job										CR	DR	
8. P. O. for Repair Mat.						CR				DR		
9. Invoice		CR	DR			CR				DR		
10. Check				DR	CR							
11. Stores Req. Job. Mat.		CR	DR				CR			DR		
12. Labor Time Tickets									CR	DR		
31. Amt. Job Is Over Est.											DR	
14. Labor Payroll		CR	DR	DR	CR							
15. Stores Req.—Supplies		CR	DR				CR				DR	
16. Teacher Payroll		CR	DR	DR	CR			CR			DR	
17. Petty Cash Exp.		CR	DR	DR	CR	CR					DR	
18. To Open Petty Cash		CR	DR	DR	CR							
19. Rev. Fund Expenditure		CR	DR	DR	CR	CR						DR
20. Rev. Fund Receipts	CR				DR							CR‡
21. Regular Receipts	CR				DR							
22. Budget Est. of Rects.	DR											
23. Budget Est. of Exp.			CR									

* This is a control account. The stock records cards are subsidiary and can be reconciled with it.

† For trial balance purposes only the unit accounts are considered. The school and control account are memoranda.

‡ The debit for this entry is in the bank account. This credit can not be considered in the trial balance since it has already been credited in the receipts register.

five dollars now appearing on the expense account. As the invoice is registered in the invoice register it becomes a credit to accounts payable in the total column and a debit to the expenditure or disbursement accounts in the general ledger columns of the invoice register.

3. When the check is written in payment of the invoice it is listed on the check register, which furnishes the debit to accounts payable. It is credited to the bank account to show the withdrawal of funds. For reference purposes a check mark can be made on the vendor's account to indicate actual payment of an invoice.
4. Same as for "1" except that the debit is to stores. Care must be taken not to consider this as stores on hand in case of fire and the subsequent underwriter's adjustment.
5. Same as "2" except that the correction for the difference between the amount of the invoice and order is entered to stores.
6. Same as "3."
7. The estimate of the cost of the repair job must be entered on the expense account to encumber the appropriation for that type of repair. For trial balance purposes the estimate entered on the job cost card which is filed in a live file forms the credit entry. The expense account is not affected again until the job has been completed, or until a requisition is approved permitting additional expenditure.
8. Material purchased for direct and immediate use on the job is credited to the vendor's account as all other purchases but debited to the job cost card.
9. Same as "2" except that the correction is entered on the job cost card.
10. Same as "3."
11. If material for use on the repair job is requisitioned from the storeroom it is credited to stores to show the necessary withdrawal and debited on the job cost card.
12. Each man sends in daily a time slip for each job on which he has worked. The total of these slips is charged to the respective jobs and credited to the labor wage record.
13. After the job is completed the amount the total is over or un-

der the estimate is added to or subtracted from the expense account. The job cost card is filed in the dead file. Careful analysis will show that the books are still in balance. The purchases from vendors, distribution of stores repair material, and the amount accumulated on the labor wage records equal the exact cost of the job, which has been entered in the expense account. Filing the job cost card for the completed job in a dead file and not onsidering it in the trial balance preserves the balance. The live cards representing work in process, however, are very essential to the balancing of the accounts.

14. The labor payroll affects only the general ledger accounts, since the amount of the labor has already been entered to the expense accounts from the job cost card. It affects the voucher register as any invoice or voucher, and the pay checks or master check affect the check register and bank accounts as any other checks.
15. A requisition for supplies or equipment from stores is charged against the expense account and credited to stores. At the end of the month or whatever period desired, preferably not more than a month, the stores distributed are entered by means of a journal voucher on the voucher-invoice register. This does not represent an account payable but is necessary to balance the distribution of costs shown in the major accounts of the voucher-invoice register. For this reason a column has been provided next to the net column to keep the register in balance. This column shows the same information monthly which the stores ledger showed daily.
16. Same as "14" for the general ledger accounts. For the subsidiary records the expense accounts are charged and the teachers' individual accounts debited.
17. At the end of the month a journal voucher can be prepared for the expenditure from petty cash. As this has to be replaced in the petty cash fund it is a credit to accounts payable and is treated as an invoice in entering. A check is wrtten for the amount and recorded as all other checks. The credit entry is made from the individual receipts accompanying the journal voucher to the accounts with the vendors and the expense accounts affected charged.

18. When the petty cash fund is opened, the procedure is the same as for replacement of money in petty cash with the exception that it is entered under revolving fund in the voucher register. It does not affect the subsidiary accounts. Replacements of money in petty cash are not entered under revolving funds but are entered under current expenditures or other account affected.
19. An expenditure which is made as an advancement with the expectation of having the same amount returned later when the goods are sold is entered in the voucher register under revolving funds. All other entries are the same as the entries accompanying any purchase except that they cannot be charged against the expense accounts but against the separate revolving fund set up to care for this type of purchase.
20. When the materials purchased to be resold at cost are resold, the money must be accounted for as a receipt credit and a charge to the bank account. The revolving fund account which serves to accumulate the charges can also serve to register the receipts.
21. All receipts are listed on the receipt register and charged to the bank in which they are deposited while credited to the proper receipt account.
22. This merely shows the effect of the budget estimate entries in connection with all other entries.

BIBLIOGRAPHY

Arnett, Trevor. College and Univ. Finance. Gen. Ed. Bd., 1922 212 pp.

Bell, A. A. School Accounting in the United States. American School Board Journal, p. 47, October 1924.

Case, H. C. Handbook of Instructions for Recording Disbursements for School Purposes. New York State Department of Education, Albany, N. Y., 1917. 25 pp.

Close, Egbert. New System of School Accounting for New Jersey. American School Board Journal, p. 58, March 1924.

Cole, W. M. Cost Accounting for Institutions. Ronald Press Co., 1920. 248 pp.

Committee on Uniform Records and Reports of the Department of Superintendence of the National Education Association. School Records and Reports. Research Bulletin, Vol. V, No. 3, 1928. National Education Association, Washington, D. C.

Cook, Henry R. M. Standardization of School Accounting and of School Statistics. American School Board Journal, p. 13, June 1913.

Deffenbaugh, W. S. School Administration in Small Cities. United States Bureau of Education, Bulletin No. 2, 1922. 75 pp.

Denver Public School Monograph No. 7. Schedule of Accounts. Denver Public Schools, Denver, Col., 1922-23.

Dohr, James L. Cost Accounting Theory and Practice. Ronald Press Co., 1924. 631 pp.

Doughton, Isaac. Cost Accounting and Budgeting in a Small City. American School Board Journal, Vol. 62, No. 1, p. 41, June 1921.

Earnest, W. W. An Expenditure Book for School Accounting. American School Board Journal, Vol. 55, No. 3, p. 52, September, 1927.

Eggleston, D. C. Municipal Accounting, pp. 32, 282ff, 297, 322. Ronald Press Co., 1922. 456 pp.

Engelhardt, Fred. Principles Governing Management and Accounting for School Plant. American School Board Journal, Vol. 75, pp. 43, 44, 51, 52, August, September 1927.

Engelhardt, Fred. The Accounting System for Smaller School Districts. American School Board Journal, Vol. 65, No. 3, pp. 44, 47, 115, 116, 119, 120, September 1922.

Engelhardt, Fred, and von Borgersrode, Fred. Accounting Procedure for School Systems. Bureau of Publications, Teachers College, Columbia University, 1927. 130 pp.

Engelhardt, N. L. and Engelhardt, Fred. Public School Business Administration. Bureau of Publications, Teachers College, Columbia University, 1927. 1068 pp.

Flynn, William J. School Surveys from Financial Viewpoint. Sixth Year Book, National Association of School Accounting Officials, 1917.

Fowlkes, John Guy. Handbook of Financial Accounting for Schools. Eau Claire Book and Stationery Co., Eau Claire, Wis., 1924.

Galloway, L. Office Management. Ronald Press Co., 1919. 701 pp.

Ganders, H. S. System of School Records and Reports for Smaller Cities, p. 24ff, 61ff, 88. Bradford Robinson Printing Co., Denver, Col., 1926. 192 pp.

Green, C. School Reporting and Accounting in a Small City, Beaver Falls, Pennsylvania. American School Board Journal, Vol. 54, pp. 27, 28, May 1917.

Hilgert, J. R. Cost Accounting for Sales. Ronald Press Co., 1926. 267 pp.

Hiller, August. School Accounting and Costs. American School Board Journal, p. 16, August 1914.

Horwath and Toth. Hotel Accounting. Ronald Press Co., 1928. 508 pp.

Job, Leonard. Uniform Cost Accounting in Indiana. American School Board Journal, p. 42, September 1924.

Kester, R. B. Accounting Theory and Practice. 2 Vol. Ronald Press Co., 1922.

Lewton, W. W. An Accounting System for Small Cities. American School Board Journal, p. 58, September 1919.

MOEHLMAN, A. B. A Uniform Financial Procedure for the Public Schools of Michigan. Bulletin No. 4, Part I, 1924. 40 pp.

MOEHLMAN, A. B. Public School Finance. Rand McNally Co., 1927. 508 pp.

MONTGOMERY, R. H. Auditing Theory and Practice, Vol. I, pp. 602, 612, 619. Ronald Press Co., 1921. 730 pp.

MOREY, LLYOD. Introduction to Governmental Accounting. Chap. VIII and XIX. Wiley Accounting Series, John Wiley & Sons, 1927. 285 pp.

MORRIS, EMMET L. The Status of the Iowa Uniform Accounting System. American School Board Journal, Vol. 77, pp.45, 46, August 1928.

MOUNT, J. S. New Jersey's Accounting System for Public Schools. American School Board Journal, Vol. 69, pp. 41-44, 119-120, December 1924.

MULLAN, J. S. Mechanical Tabulation of School Financial Statistics. American School Board Journal, Vol. 52, pp. 18-19, 89, August 1916.

OAKEY, FRANCIS. Principles of Government Accounting and Reporting. Chap. XII. D. Appleton & Co., 1921. 561 pp.

ORR, LAURENCE F. Uniform Accounting System for School Cities and Towns. State Department of Public Instruction, Indianapolis, Ind., 1926. 41 pp.

PEEL, ARTHUR J. Simplified School Accounting. Bruce Publishing Co., Milwaukee, Wis., 1925. 118 pp.

ROREM, S. School Accounting in 115 Cities Under 25,000 Population. School Board Journal, Vol. 55, pp. 53-55, September 1927.

SALIERS, E. A. Accountants' Handbook. Section 26. Ronald Press Co., 1923. 1596 pp.

SIGERSON, W. C. Digest of Accounting Organization and Practice. General Office Equipment Corp., 1926. 78 pp.

SCHACKEL & LANG. Accounting by Machine Methods. Ronald Press Co., 1929.

SMITH, H. P. Accounting System and Budgeting of a Small City. American School Board Journal, Vol. 61, No. 5, pp. 41-43, 100, November 1920.

SMITH, H. P. Research in the Business Management of Public Schools. American School Board Journal, Vol. 76, p. 45, April 1928.

TAYLOR, ROBERT B. Principles of School Supply Management. Bureau of Publications, Teachers College, Columbia University. 1926. 145 pp.

TURCK, J. A. V. Origin of Modern Calculating Machines. Western Society of Engineers, 1921.

WALTON, SEYMOUR & FINNEY. Mathematics of Accounting and Finance. Ronald Press Co., 1922. 274 pp.

WASHBURN, E. L. Accounting for Universities. Ronald Press Co., 1926. 126 pp.

WILLIAMS, ALEN J. What Records are Essential in a School System of 25 to 50 teachers. American School Board Journal, Vol. 61, No. 6, p. 54, December 1920.

WOODS, C. E. Unified Methods for Industrials. Ronald Press Co., 1920. 484 pp.

APPENDIX A

A COMPREHENSIVE CODE FOR SCHOOL RECEIPTS AND EXPENDITURES, ESPECIALLY SUITABLE FOR USE WITH TABULATING MACHINES

The following code is flexible enough to be used in any size system. As it is presented here it is complete enough for cities over 100,000. The type of organization will always determine the detail of the code. The purpose of any such code of accounts can only be to serve as a model or scheme to be followed. The only adjustment that is important in using this code for cities below 100,000 is in general control. The smaller city will have less departments or bureaus. The other accounts will or should be practically identical for all size cities, the work being lessened only by the smaller number of buildings and fewer types of instruction.

This code is so constructed that the financial information can be easily secured in conformity with the accounting classification accepted by the United States Bureau of Education. The first number of the code gives the major character classification. 0 to 1 inclusive indicate general control; 2 to 3 indicate instruction, of which 2 indicates supervision and 3 instruction; 4 indicates auxiliary agencies and coordinate activities etc. The second figure always indicates the same functional classification. 0 is left for those expenditures which are not classified under any of the other numbers. 1 indicates salaries other than clerical, 2 indicates clerical salaries, 3 indicates supplies, 4 indicates texts, 5 indicates supplementary books. The third figure gives the subdivisions of the major character account. In general control this third figure refers to the department or subject, etc. The fourth number of the code is left for further subdivision of either the classification of the second or third number.

Under Instruction this fourth number is used to subdivide general teaching into subjects. Under Maintenance it is used to keep account of costs by object repaired. This code makes possible the keeping of maintenance costs for 90 different types of objects with 10 miscellaneous accounts under 10 different divisions of maintenance accounts. The code can be revised to include more individual accounts by object or, if this information is desired in unusual detail, a separate code can be set up for the items usually repaired in the same way as a separate code is set up for materials and supplies. The cost can then be tabulated separately by the repair object code in the same manner as the cards are tabulated by the material code for posting to the stock record cards.

The claims made for this code are:

1. It shows cost information readily according to the United States Bureau Classification of Accounts.
2. It is easily learned since the first and second figures always mean the same thing. (2 as the first figure always means supervision and 3 as the second figure always means supplies or materials.)
3. It is readily adapted to the needs of any size city or the demands of any detailed accounting requirements.
4. The amount of sorting and tabulating is reduced to a minimum, if tabulating equipment is used.

When the cards are sorted and tabulated on the first number the cost by major classification is given. When the cards are sorted and tabulated on the third number the cost by department, subject, or activity is shown. When they are tabulated on the second number the cost by object is given, and on the fourth greater detail of the second and third is given.

CODE FOR EXPENDITURES

0100	School Elections, Professional Salaries
0200	School Elections, Clerical Salaries
0300	School Elections, Supplies
0900	School Elections, Miscellaneous
0110	School Census, Professional Salaries
0210	School Census, Clerical Salaries
0310	School Census, Supplies

0910	School Census, Miscellaneous
0120	Finance Office, Professional Salaries
0220	Finance Office, Clerical Salaries
0320	Finance Office, Supplies
0920	Finance Office, Miscellaneous
0130	Department of Buildings and Grounds, Professional Salaries
0230	Department of Buildings and Grounds, Clerical Salaries
0330	Department of Buildings and Grounds, Supplies
0930	Department of Buildings and Grounds, Miscellaneous
0140	Bureau of Supplies, Professional Salaries
0240	Bureau of Supplies, Clerical Supplies
0340	Bureau of Supplies, Supplies
0940	Bureau of Supplies, Miscellaneous
0150	Office of the Business Manager, Professional Salaries
0250	Office of the Business Manager, Clerical Salaries
0350	Office of the Business Manager, Supplies
0950	Office of the Business Manager, Miscellaneous
0160	Purchasing Department, Professional Salaries
0260	Purchasing Department, Clerical Salaries
0360	Purchasing Department, Supplies
0960	Purchasing Department, Miscellaneous
0991	Board of Education Expense
0992	Expense of Audit
0993	Legal Expense
0994	Tax Collecting
0995	Adminstration Building
1100	Superintendent's Office, Professional Salaries
1200	Superintendent's Office, Clerical Salaries
1300	Superintendent's Office, Supplies
1900	Superintendent's Office, Miscellaneous

1110	Research Department, Professional Salaries
1210	Research Department, Clerical Salaries
1310	Research Department, Supplies
1910	Research Department, Miscellaneous
1120	Bureau of Child Acctg. and Statistics, Professional Salaries
1220	Bureau of Child Acctg. and Statistics, Clerical Salaries
1320	Bureau of Child Acctg. and Statistics, Supplies
1920	Bureau of Child Acctg. and Statistics, Miscellaneous
1130	Bureau of Records and Services, Professional Salaries
1230	Bureau of Records and Services, Clerical Salaries
1330	Bureau of Records and Services, Supplies
1930	Bureau of Records and Services, Miscellaneous
1140	Administration of Community Centers and Playgrounds, Professional Salaries
1240	Administration of Community Centers and Playgrounds, Clerical Salaries
1340	Administration of Community Centers and Playgrounds, Supplies
1940	Administration of Community Centers and Playgrounds, Miscellaneous
1150	Administration of Physical Welfare, Professional Salaries
1250	Administration of Physical Welfare, Clerical Salaries
1350	Administration of Physical Welfare, Supplies
1950	Administration of Physical Welfare, Miscellaneous
2100	General Supervision, Professional Salaries
2200	General Supervision, Clerical Salaries
2300	General Supervision, Supplies
2900	General Supervision, Miscellaneous
2110	Principal's Salary for Supervision
2120	General Subject or Grade Supervisors
2130	Art Supervisors Salaries

2140	Music Supervisors Salaries
2150	Home Economic Supervisors Salaries
2160	Manuel Training Supervisors Salaries
2170	Physical Education Supervisors Salaries

(If supervisors are given clerical service and separate allotment of supplies, the code follows the usual procedure, e.g. General Subject Supervisors, Clerical Service, 2220; General Subject, Supplies, 2320, etc. General Subject can be further subdivided as 2121—English Supervisors' Salaries, or First Grade Supervisors' Salaries; 2122 Mathematics Supervisors' Salaries, or Second Grade Supervisors' Salaries. The type code separates the high school from elementary and, therefore, the general subject from grade.)

3110	Principal's Office, Professional Salaries
3210	Principal's Office, Clerical Salaries
3310	Principal's Office, Supplies
3910	Principal's Office, Miscellaneous

(3120 General Subject or Grade Teachers' Salaries)

3121	English Teachers' or First Grade Teachers' Salaries
3122	Mathematics or Second Grade Teachers' Salaries
3123	Modern Language or Third Grade Teachers' Salaries
3124	Ancient Languages or Fourth Grade Teachers' Salaries
3125	Social Science or Fifth Grade Teachers' Salaries
3126	Science or Sixth Grade Teachers' Salaries

3320 General Subject Supplies

(This number can be used for all high school general supplies or they can be allocated as the salaries by subject using the same numbers as for grade supplies since the type code separates them.)

3321	First Grade General Supplies
3322	Second Grade General Supplies

3323	Third Grade General Supplies
3324	Fourth Grade General Supplies
3325	Fifth Grade General Supplies
3326	Sixth Grade General Supplies

3421	English Texts	First Grade Texts
3422	Mathematics Texts	Second Grade Texts
3423	Modern Language Texts	Third Grade Texts
3424	Ancient Language Texts	Fourth Grade Texts
3425	Social Science Texts	Fifth Grade Texts
3426	Science Texts	Sixth Grade Texts

(3520 Supplementary Books for General Subjects and Grades)

3521	Supplementary Books, English and First Grade
3522	Supplementary Books, Mathematics and Second Grade
3523	Supplementary Books, Modern Language and Third Grade
3524	Supplementary Books, Ancient Languages and Fourth Grade
3525	Supplementary Books, Social Science and Fifth Grade
3526	Supplementary Books, Science and Sixth Grade

3130	Art Teachers' Supplies
3330	Art Supplies
3430	Art Texts
3530	Art Supplementary Books

3140	Music Teachers' Salaries
3340	Music Supplies
3440	Music Texts
3540	Music Supplementary Books

3150	Home Economics Teachers' Salaries
3350	Home Economics Supplies
3450	Home Economics Texts
3550	Home Economics Supplementary Books

3160	Manual Training Teachers' Salaries

3360	Manual Training Supplies
3460	Manual Training Texts
3560	Manual Training Supplementary Books
3170	Physical Education Teachers' Salaries
3370	Physical Education Supplies
3470	Physical Education Texts
3570	Physical Education Supplementary Books
3180	Commercial Teachers' Salaries
3380	Commercial Supplies
3480	Commercial Texts
3580	Commercial Supplementary Books
(3090	Other Expenses of Instruction)
3191	Salaries of Librarians
3291	Librarians' Clerical Service
3591	Supplementary Books not Allocated to Grade or Subject
3391	Library Supplies
3991	Library, Miscellaneous
3992	Exhibits
3993	Commencement
4000	Transportation, Maintenance
4100	Transportation, Salaries
4300	Transportation, Supplies
4900	Transportation, Miscellaneous, Carfare, etc.
4110	Playgrounds, Salaries
4310	Playgrounds, Supplies
4910	Playgrounds, Miscellaneous
4120	Medical Inspection, Professional Salaries
4320	Medical Inspection, Supplies

4920	Medical Inspection, Miscellaneous
4130	Dental Service, Professional Salaries
4330	Dental Service, Supplies
4930	Dental Service, Miscellaneous
4140	Nurse Service, Professional Salaries
4340	Nurse Service, Supplies
4940	Nurse Service, Miscellaneous
4150	Compulsory Attendance, Professional Salaries
4250	Compulsory Attendance, Clerical Salaries
4350	Compulsory Attendance, Supplies
4950	Compulsory Attendance, Miscellaneous
4160	Public Library, Salaries
4360	Public Library, Supplies
4960	Public Library, Miscellaneous
4700	Lunch Room Deficits
4170	Free Lunch Salaries
4370	Free Lunch Supplies
4970	Free Lunch Miscellaneous Expense
4900	Net Cost of Revolving Funds
4991	Care of Children in Institutions
4992	Tuition Payable to Other Schools
4993	Adult Lectures
5100	Janitors' Salaries
5101	Engineers' Salaries
5102	Firemen's Salaries
5103	Matrons' Salaries
5104	Telephone Operators' Salaries
5105	Watchmen's Salaries
5106	Extra Help Salaries

5300	Janitorial Supplies

5010	Fuel
5020	Water
5030	Power
5040	Light
5050	Telephone
5060	Care of Grounds
5070	Other Expenses of Operation

6101	Upkeep of Flagpoles—Labor
6102	Upkeep of Walks—Labor
6103	Upkeep of Fences—Labor
6104	Upkeep of Drains—Labor
6105	Upkeep of Sewers—Labor
6106	Upkeep of Driveways—Labor
6107	Regrading and Reseeding Lawns—Labor
6108	Replanting Flowers, Shrubs, and Trees—Labor
6109	Other Upkeep of Grounds—Labor

6301	Upkeep of Flagpoles—Material
6302	Upkeep of Walks—Material
6303	Upkeep of Fences—Material
6304	Upkeep of Drains—Material
6305	Upkeep of Sewers —Material
6306	Upkeep of Driveways—Material
6307	Regrading and Reseeding Lawns—Material
6308	Replanting—Material
6309	Other Upkeep of Grounds—Material

6110	Upkeep of Roofs, Gutters, Drains, etc.,—Labor
6111	Repair of Masonry, Painting, Plastering—Labor
6112	Upkeep of Blackboards and Trim—Labor
6113	Upkeep of Floors—Labor
6114	Upkeep of Doors, Checks, Stops, Locks—Labor
6115	Upkeep of Sash Cords, Chains, and Window Woodwork—Labor
6116	Glazing —Labor

6117	Painting—Labor
6118	Upkeep of Stairs and Stairways—Labor
6119	Other Upkeep of Building—Labor

6310	Upkeep of Roofs, Gutters, Drains—Material
6311	Repair of Masonry, Painting, Plastering—Material
6312	Upkeep of Blackboards, Trim-Material
6313	Upkeep of Floors—Material
6314	Upkeep of Doors, Checks, Stops, Locks—Material
6315	Upkeep of Sash Cord, Chains, and Window Woodwork—Material
6316	Glazing—Material
6317	Painting—Material
6318	Upkeep of Stairs and Stairways—Material
6319	Other Upkeep of Building—Material

6120	Upkeep of Boilers and Furnaces—Labor
6121	Upkeep of Radiators—Labor
6122	Upkeep of Pumps—Labor
6123	Upkeep of Fans—Labor
6124	Upkeep of Plenum Chambers—Labor
6125	Upkeep of Temperature Control—Labor
6126	Upkeep of Ash Hoists—Labor
6127	Upkeep of Steam Lines and Valves—Labor
6129	Other Upkeep of Heating and Ventilating—Labor

6320	Upkeep of Boilers and Furnaces—Material
6321	Upkeep of Radiators—Material
6322	Upkeep of Pumps—Material
6323	Upkeep of Fans—Material
6324	Upkeep of Plenum Chambers—Material
6325	Upkeep of Temperature Control Apparatus—Material
6326	Upkeep of Ash Hoists—Material
6327	Upkeep of Steam Lines—Material
6329	Other Upkeep of Heating and Ventilating—Material

6130	Upkeep of Service Connections—Labor

6131 Upkeep of Switchboards, Switches, Fuses—Labor
6132 Upkeep of Electrical Fixtures—Labor
6133 Upkeep of Wiring—Labor
6134 Upkeep of Grounds—Labor
6135 Upkeep of Gas Fixtures and Lines—Labor
6139 Other Upkeep of Lighting—Labor

6330 Upkeep of Service Connections—Material
6331 Upkeep of Switchboards, Switches, Fuses—Material
6332 Upkeep of Electrical Fixtures—Material
6333 Upkeep of Wiring—Material
6334 Upkeep of Ground Connections—Material
6335 Upkeep of Gas Fixtures and Lines—Material
6339 Other Upkeep of Lighting—Material

6140 Upkeep of Fire Extinguishers—Labor
6141 Upkeep of Fire Hose—Labor
6142 Upkeep of Fire Escapes—Labor
6149 Other Upkeep of Fire Protection Apparatus—Labor

6340 Upkeep of Fire Extinguishers—Material
6341 Upkeep of Fire Hose—Material
6342 Upkeep of Fire Escapes—Material
6349 Other Upkeep of Fire Protection Apparatus—Material

6150 Upkeep of Fountains—Labor
6151 Upkeep of Toilets—Labor
6152 Upkeep of Urinals —Labor
6153 Upkeep of Tanks—Labor
6154 Upkeep of Sinks and Lavatories—Labor
6155 Upkeep of Mirrors and Cabinets—Labor
6156 Upkeep of Piping—Labor
6159 Other Upkeep of Plumbing—Labor

6350 Upkeep of Fountains—Material
6351 Upkeep of Toilets—Material
6352 Upkeep of Urinals—Material

6353 Upkeep of Tanks—Material
6354 Upkeep of Sinks and Lavatories—Material
6355 Upkeep of Mirrors and Cabinets—Material
6356 Upkeep of Piping—Material
6359 Other Upkeep of Plumbing—Material

6170 Upkeep of Desks and Chairs—Labor
6171 Upkeep of Files, Cabinets, Cases—Labor
6179 Other Upkeep of Furniture—Labor

6370 Upkeep of Desks and Chairs—Material
6371 Upkeep of Files, Cabinets, Cases—Material
6379 Other Upkeep of Furniture—Material

6180 Upkeep of Playground Equipment—Labor
6181 Upkeep of Gymnasium Equipment—Labor
6182 Upkeep of Commercial Equipment—Labor
6183 Upkeep of Home Economics Equipment—Labor
6184 Upkeep of Laboratory Equipment—Labor
6185 Upkeep of Shop Equipment—Labor
6186 Upkeep of School Office Equipment—Labor
6187 Upkeep of Music and Auditorium Equipment—Labor
6188 Upkeep of Lunch Room Equipment—Labor
6189 Other Upkeep of Equipment—Labor

6380 Upkeep of Playground Equipment—Material
6381 Upkeep of Gymnasium Equipment—Material
6382 Upkeep of Commercial Equipment—Material
6383 Upkeep of Home Economics Equipment—Material
6384 Upkeep of Laboratory Equipment—Material
6385 Upkeep of Shop Equipment—Material
6386 Upkeep of School Office Equipment—Material
6387 Upkeep of Music and Auditorium Equipment—Material
6388 Upkeep of Lunch Room Equipment—Material
6389 Other Upkeep of Equipment—Material

6160 Upkeep of Clocks—Labor

6161 Upkeep of Bells and Buzzers—Labor
6162 Upkeep of Batteries—Labor
6163 Upkeep of Motors—Labor
6164 Upkeep of Telephones—Labor
6165 Upkeep of Elevators—Labor
6169 Other Upkeep of Electrical Service—Labor

6360 Upkeep of Clocks—Material
6361 Upkeep of Bells and Buzzers—Material
6362 Upkeep of Batteries—Material
6363 Upkeep of Motors —Material
6364 Upkeep of Telephones—Material
6365 Upkeep of Elevators—Material
6369 Other Upkeep of Electrical Service—Material

6190 Other Expense of Maintenance—Labor
6390 Other Expense of Maintenance—Material

7000 Boiler Insurance
7001 Fire Insurance on Buildings
7002 Fire Insurance on Equipment
7003 Fire Insurance on Supplies
7004 Cyclone Insurance
7005 Liability Insurance, Automobile Personal Injury
7006 Liability Insurance, Automobile Property Damage
7007 Workmen's Compensation
7008 General Accident
7009 Miscellaneous Insurance

7011 Rental of Land
7012 Rental of Buildings
7013 Rental of Equipment
7014 Other Rent Payments

7020 Pensions

7030 Retirement Fund

7040 Contributions and Contingencies

8000 Redemption of Bonds from Sinking Funds
8001 Redemption of Bonds from Current Income
8002 Redemption of Short Term Loans

8010 Interest Paid for Sinking Funds
8011 Interest Paid for Current Funds
8012 Interest Paid for Short Term Loans

8020 Discounts on Warrants

8030 Interest on Overdue Warrants of Current Year

8040 Payments on Warrants of Preceding Years

8050 Interest on Warrants of Preceding Years

8060 Payments to Sinking Fund

8070 Refunds of Erroneous Receipts

9000 Purchase of Land

9011 Improvement of New Sites
9012 Improvement of Old Sites

9021 Building New Structures
9022 Alterations and Additions to Old Structures

9031 New Structures—Heating and Ventilating
9032 New Structures—Fire Protection
9033 New Structures—Artificial Lighting
9034 New Structures—Plumbing
9035 New Structures—Electric Service

9041 Old Structures—Heating and Ventilating

9042	Old Structures—Fire Protection
9043	Old Structures—Artificial Lighting
9044	Old Structures—Plumbing
9045	Old Structures—Electric Service

9051	Furniture for New Buildings
9052	Furniture for Old Buildings

9061	Instructional Apparatus for New Buildings
9062	Instructional Apparatus for Old Buildings

9070	Prepaid Expenses

9091	Other Capital Outlay for New Buildings
9092	Other Capital Outlay for Old Buildings

CODE FOR REVOLVING FUNDS

The same code can be used for revolving fund receipts as for revolving fund expenditures. If tabulating equipment is used this is especially desirable since the two are tabulated together. The selecting and subtracting block separates the expenditures from the receipts and makes the subtraction of expenditures from receipts. The first two figures (08) of the code serve to select the revolving fund cards. In coding the posting media of revolving funds it will be necessary to use a letter to distinguish receipts from expenditures. This letter, however, is not placed on the tabulating cards.

0800	Petty Cash
0810	Textbooks
0820	Special Materials for Instruction
0821	Agriculture
0823	Fine Arts
0825	Household Arts
0826	Industrial Arts
0827	Science
0828	Commercial Education
0830	Other Instructional Material
0840	School Lunch
0850	Athletics
0860	Forensics
0870	School Entertainments
0880	School Publications
0890	Other Materials Bought for Resale

CODE FOR RECEIPTS

The code for receipts utilizes the same numbers as the code for expenditures. Since the receipts documents and accounts are entirely separate from those of expenditures, this is possible. If tabulating equipment is used, the two are tabulated separately, thus avoiding confusion.

The last number of the code can be used to distinguish between federal, state, county, and local sources of receipts.

—1	Federal Receipts
—2	State Receipts
—3	County Receipts
—4	Local Receipts

(1000–5000 Revenue Receipts)
(1000–1990 Appropriations and Subventions)

1000	Agriculture
1100	Commercial Education
1200	Fine Arts
1300	Household Arts
1400	Industrial Arts
1500	Library
1600	Special Education
1610	Blind
1620	Deaf
1630	Sub-normal
1900	Teacher Training
1910	Elementary Aid
1920	High School Aid
1930	Junior College Aid
1940	Transportation

1950 Tuition Aid
1960 Supplemental Aid
(2000–2990 Taxation for Maintenance)
2100 General Property Tax
2200 Business Tax
2300 Poll Tax
2400 Monies and Credits
2500 Mortgage Registry
(3000–3990 Taxation for Debt Service)
3100 Sinking Fund
3200 Interest on Bonds
3300 Interest on Short-Term Loans
(4000–5990 All Other Revenue Receipts)
4000 Income from Permanent School Funds
4100 Leases of School Lands
4200 Tuition from Patrons
4210 Tuitions from Other Districts
4300 Additional Transfers from Other Districts
4400 Contributions and Gifts
4500 Fines and Penalties
4600 Rents
4710 Interest on Sinking Fund Deposit
4720 Interest on Building Fund Deposit
4730 Interest on Bank Deposits
4740 Sinking Fund Investment
4800 Fees
4900 Net Receipts from Revolving Funds
5000 Tax Penalties
(6000–9000 Non-Revenue Receipts)
(6000–6990 Receipts from Sale of Bonds and Loans)
6000 Bonds
6100 Premium on Bonds
6200 Temporary Loans
(7000–7990 Sale of Property and Proceeds of Insurance Adjustments)
7100 Land
7200 Buildings

7300 Supplies
7400 Equipment
7500 Other Property
7600 Proceeds from Insurance Adjustments on Buildings
7700 Refunds
7800 Insurance on Supplies
7810 Insurance on Equipment
7820 Other Insurance Adjustments
8000 All Other Non-Revenue Receipts

APPENDIX B

THE NAMES OF THE SCHOOLS AND UNIVERSITIES INCLUDED IN THIS STUDY

PUBLIC SCHOOLS

Visited

- Toledo, Ohio
- Johnstown, Pa.
- Chicago, Ill.
- Rochester, N. Y.
- Indianapolis, Ind.
- Cleveland, Ohio
- Syracuse, N. Y.
- Milwaukee, Wis.
- Detroit, Mich.
- Minneapolis, Minn.
- Pittsburgh, Pa.
- Wilkesbarre, Pa.
- Scranton, Pa.
- New Haven, Conn.
- Pottsville, Pa.
- New York City
- Montclair, N. J.

Not Visited

- Atlanta, Ga.
- Lincoln, Neb.
- Oroville, Cal.
- Fullerton, Cal.
- Los Angeles, Cal.
- Baltimore, Md.
- Pasadena, Cal.
- Santa Barbara, Cal.
- Salt Lake City, Utah
- New Orleans, La.
- Covington, Ky.
- San Francisco, Cal.
- Denver, Col.
- Mansfield, La.
- San Bernardino, Cal.
- Nesquehoning, Pa.
- Lehighton, Pa.

UNIVERSITIES

Visited

- Michigan
- Wisconsin
- Minnesota
- Northwestern
- Illinois
- Chicago
- New York Univ.
- Columbia

Not Visited

- Miami
- N. Y. College of Agr.
- Drake
- Goucher
- Indiana
- Culver
- Drexel
- Penn State
- Univ. of Penna.

VITA

W. W. Kemmerer was born on March 31, 1903 in Bushkill Township, Northampton County, Pennsylvania. He attended the rural school of the county and later a public high school. He received the degree of Bachelor of Arts in 1924 from Lehigh University, Bethlehem, Pennsylvania. From 1924 to 1927 he taught in the high schools in Williamsport, Pennsylvania; Nesquehoning, Pennsylvania; and New Rochelle, New York.

In 1927-1928 he worked as part time assistant in the Department of School Administration, Teachers College, Columbia University.

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END OF
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